Journal of FORESTRY

MAY 1951

SOCIETY OF AMERICAN FORESTERS 1900

Volume 49
Number 5

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VOLUME 49 • NUMBER 5 MAY 1951

Journal of Forestry

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The JOURNAL OF FORESTRY, established in 1917, is the official organ of the Society of American Foresters, but the Society assumes no responsibility for the statements and opinions expressed by contributors.

Publication office, 825 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Address all correspondence concerning editorial or business matters to JOURNAL OF FORESTRY, 825 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Published monthly. Subscriptions, $6 per year; single copies, 60 cents. Missing numbers will be replaced without charge provided claim is made within thirty days after date of the following issue.

The editors are not responsible for loss or damage of manuscripts and photographs while in transit or in their possession. All material submitted for publication should be accompanied by return postage.

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Photo by Arnold F. Wallen, Hammon, Jensen & Wallen Mapping and Forestry Services, Oakland, Calif.

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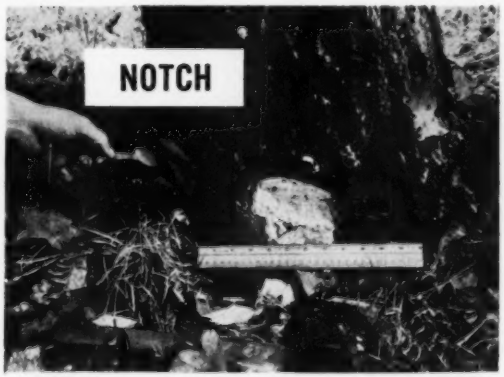

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Journal of Forestry

Official Organ of the Society of American Foresters

Some of My Best Friends Are Foresters

An Editorial

James Stevens
West Coast Lumbermen's Association.

"We sat on a terrace in Seattle, and looked across the dancing blue saucer of Lake Washington; on the far shore were banks of trees, and I began to learn a new vocabulary. Halfway down the slope the tree line stops, and patches in the forest are bare, like bald spots, but with a few trees left standing—'seed blocks' as they are called. . . . The lumber companies may pay lip service to the principle of sustained yield—usually after having logged a property off—and they may profess a conscientious interest in conservation, but not many think of maintaining a whole forest as a living entity in perpetuity. The Forest Service says flatly, 'Some *80 per cent* (italics mine) of the cutting in private lands is still done without conscious regard to future crops. . . . .' Most distinctly the United States government is in the lumber business. The origin of this goes back to Grover Cleveland, Theodore Roosevelt, and the early conservationists. The national forests and the national parks were established, and the Forest Service began its admirable work. . . . What the government cuts it cuts selectively. And the Forest Service believes firmly there should be public regulation of private forest land."—*INSIDE U. S. A.* by John Gunther.

IT WAS TO me that John Gunther put his well-mannered but sceptical questions on the afternoon he investigated the Pacific Northwest forestry problem, using a Seattle cocktail party as a seat of inquiry. He did not like what he had seen on the logged and burned-over areas of the region's commercial forest lands. He was not concerned with issues between public and private forest ownership. His interest was focused simply on what appeared as bad management to him. I understood him to believe that all professional foresters were falling down on their responsibilities.

"Some of my best friends are foresters" I said, squaring off to defend them.

Eastward across Lake Washington the work and accomplishments of both public and private foresters were plain in my sight. The first miles up from the far shore were "rural residential." There homes could scarcely be seen for the trees. The land lifted away under more trees. Some were forests of red alder that had replaced the Douglas-fir and western hemlocks after repeated fires. On yet higher slopes were ragged checkerboards of newly logged land between blocks and strips of old timber, a well-managed tree farm. On uplands that swept to timberline a famously managed national forest ran north and south. I could single out twisting threads in the scene that marked farm valleys with model woodlots.

The land had stories to tell; good stories in the main; of American private enterprise and public specialization; of government and business and agriculture working together competently on the ground; of promise for the future. And foresters had strong hands in every productive phase of it.

"Friends of mine," I said to John Gunther. "Technically trained men who are at work with loggers and farmers for the health of the land and with town folks who depend on forest management to keep their towns growing. You ought to come up and visit with them."

But there was no time. There was not even time to talk, outside generalities, about the picture of land use spread away there for fifty miles before us. So the end result of the cocktail party conversation was the quotation at the top of this piece.

Let me not leave blame attached to Mr. Gunther. He naturally supposed that I was handing him the propaganda line of the forest industries, despite my sweet talk about the federal and state forestry men in the hills to the east. He had already been fully equipped with the propaganda line of the U. S. Department of Agriculture. Eventually Mr. Gunther chose to accept the offerings of the government's P. R. men for the forestry pages of his best-selling book.

The point is that in this case—and it is a case of continuing importance—the specific interests of the forestry profession itself were lost in the bush. To picture it in my own familiar terms, Big Government had a hearing with Mr. Gunther, the eminent publicist, so did the Paul Bunyan of forest industry, but the Peewee Purdy of professional forestry was not directly represented. (I hope you know that Peewee Purdy was the runt of all Paul Bunyan's men—he broke his leg one winter, three feet below the knee.)

The Gunther case illustrates perfectly the steadily increasing need for a Society of American Foresters public relations action program, with all the organized forces of both public and private forestry interests solidly behind it. A public relations objective is wanted, and a code, and activities in force.

For forty years I've watched the foresters emerge from the woods and move self-consciously into the public view. Back in the 1920's, when foresters were noticed at all by people in other ways of life, they were thought of as government men who roosted in towers on mountain peaks, looking for fires to fight. In movies and magazine fiction the forester was a woodsy version of the standard cowboy hero—a government gun-toter in choke-bore pants who battled timber-stealing lumbermen in lieu of cattle rustlers, and who rescued the girl in the big forest fire scene.

As the tourist trade boomed in the 1920's, with millions visiting the national parks each year, the park rangers reaped the profits from the work of the fictioneers with forestry characters. A ballad that I composed in that era recited the grief and woe of an innocent girl tourist who yielded to the wiles of an eighth-grade park ranger in the delusion that he was a Yale man—a Yale forester. The ballad was a failure. The sordid story was too commonplace in real life to be dramatized. Park rangers still pretend to be college foresters with the vacationing fair sex, while the real ones are out battling budworms on lonely tree farms or keeping watch on gyppo loggers in remote ranger districts.

Such problems, of course, are simple to solve. Adequate publicity is the answer. One effect of the incredible growth of the information and education sections of the federal forestry divisions has been to make the professional forester who is in government employment better known—but as a government employee! Similarly, the public relations organizations of the forest industries have in the past ten years impressed the public with the fact that industry is providing jobs for thousands of technically trained foresters. Out of such publicity, through press, radio, movies, television, literature, the profession of forestry has been brought from behind the green curtain and given a real presence to the general public.

But is it not too much the presence of a hired man? I believe it is. And I believe that it is not good for either government or industry for this to be so. I believe that the best thing for both the government and the industrial employers of foresters to do is to go as far as the law allows in making them men of professional independence and glorifying that independence to the public.

The job has to start with the foresters themselves, with their professional Society. A very first need for it is a bible of professional forestry public relations; a book of unimpeachable authority on the story of what American forestry is today, how it came to be, and what promise it holds as a profession for America's future. The need is for a book that will tell a story to grip the layman with conviction of its truth and to instruct him agreeably through the arts of narration and the parable.

My want with John Gunther was just such a book. Had I been able to turn over to him a copy of a bible of American forestry of that kind, he would have forgotten the government line and the industry line and have followed the line of professional forestry in making up his woods pages for *Inside U. S. A.* But in that year of 1945 when I met John Gunther at a cocktail party there was no such book.

There is now—or there will be before May is done. The book is *Forests and Men*, the publisher is Doubleday & Company, Inc., and the author is William B. Greeley. A suspense-holding narration on what the author has seen, heard, believed, doubted, loved, hated, toiled for, and fought against in fifty years of professional forestry life, *Forests and Men* is a vital record and a voice of faith, a book to swear by and build from. It is a book for any forester to take up and cite chapter and verse to meet well-nigh any inquiry that the layman may ask on what American forestry is today, how it came to be, and what it portends. The forestry prophets are in it, and the law-givers, the psalmist is heard, there are wars, and there are peacemakers.

All that I can think of as essential to a public relations bible for the forestry profession is in *Forests and Men*. It is the book to hand to the writer and the editor, to the minister and the teacher, to the public official and the legislator. It is a perfect source book for forestry radio programs, for a series of newspaper articles on American forestry, for a forestry motion picture.

Through 1950 and up to the present a special Committee on Public Relations of the Society has been at work on the making of an action program for national and sectional public relations activities. Albert Arnst is chairman. Other members are Charles S. Cowan, Charles Tebbe, William S. Swingler, Jim C. McClellan, and Albert Wiesendanger. They have made wonderful progress in program development, and I hope this paper may serve as a contribution to it. On this conclusion, I venture to part my beard and let solemn warning issue.

Beware, O Brethren, a program that calls for meetings at which foresters will gather and rise again to talk to themselves. Look away from projects for organizations and publications which will repeat this error. The first value of *Forests and Men* is the effect it gives of Bill Greeley talking forestry to the folks outside the profession. It is an invaluable pattern for putting forestry before the people.

The Society of American Foresters has a growing public relations program. A bible for it has been published by the world's largest publishing house. The time has come for all hands to pitch in and work for the common good of the profession to the end that every American may learn to say, "Some of my best friends are foresters," instead of, "Foresters? Ain't that a lodge?"

Henry Solon Graves

1871-1951

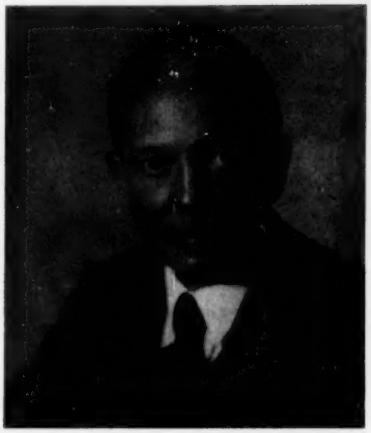
THE death of Henry Solon Graves on March 7, 1951 marks the passing of the last of the leaders who established forestry as a profession in the United States. Harry Graves, Yale '92, was the second American to study professional forestry abroad. With Gifford Pinchot, Yale '89, he started the actual practice of forestry in this country, in the mid '90s. From then on Graves' life-work was in three parts: (1) teaching forestry as a profession; (2) forest administration; (3) broad directive work in forestry and in conservation. His life was long and active, characterized by continuous public service. He was born in Marietta, Ohio on May 3, 1871. On December 19, 1903 he married Miss Ella Marian Welch of New Haven, Conn. Except for the years in Washington, D. C., the Graves always made their home in New Haven.

At first Graves helped Pinchot by making "working plans"—that worked—for three privately owned forests. On July 1, 1898 when Pinchot took over the inconspicuous Division of Forestry in the U. S. Department of Agriculture, Graves joined also, as assistant chief. For two years he helped lay foundations that enabled the division to be advanced to a bureau in 1901, and in 1905 to become the U. S. Forest Service. Both men realized that the immediate and basic need was for trained foresters.

So, in 1900, Graves went to New Haven to become the first head and director of the Yale Forest School, with funds supplied by the Pinchot family. It was a new kind of school in that it taught forestry to American college-bred men for application on the national forests. It would, as a graduate school, said Graves, "draw men possessing the qualifications for leadership in the new forestry movement." In those busy, early days of the school, in addition to other duties, Graves wrote two of the first American textbooks on forestry: *Forest Mensuration*, 1906; and *Principles of Handling Woodlands*, 1911. Of Graves, at that time, Pinchot had this to say in his autobiography: "To him more than to any other individual, as the years went by, was due the high credit for setting up the standards of training, ethics, and performance which have given the profession of Forestry so high a place in American life."

The second main accomplishment for which Henry S. Graves is gratefully remembered is his service, for a decade—from February 1910 to March 1920—as chief of the Forest Service, succeeding Pinchot. The full significance of the vital work done by the Forest Service in that critical period still awaits adequate telling. But it was Forester Graves' hand that shaped the plans throughout. During World War I Graves served overseas as lieutenant colonel, Corps of Engineers (Forestry Regiment) helping effect a record of timber production for our troops from forests in France. Near the end of his term as Forester he gave a new slant to the practical application of forestry by starting the movement to define "minimum silvicultural requirements."

In 1922 Mr. Graves returned to Yale to undertake the third chapter of his career. Now dean of the Yale School of Forestry, he assumed broader relations both within and beyond Yale University. The school itself was strengthened. Then and later he gave material aid to the American Forestry Association. Soon followed that notable event, the Forest Education Inquiry, 1929-1931, which resulted in the "classic" volume *Forest Education*, by Graves and



Guise, 1932. Many others of his voluminous writings also date from these years. From 1923 to 1927 Dean Graves served as provost of Yale University.

Many distinctions came to Dean Graves over the years: the honorary Master of Arts, from Yale in 1900 and from Harvard in 1911; the LL.D., Syracuse, 1923, and Yale, 1940; election as president of the Society of American Foresters, 1912; Fellow, 1918; The Sir William Schlich Memorial Medal, 1944; The Gifford Pinchot Medal, 1950.

Mr. Graves retired as dean and Sterling professor of forestry, emeritus, in 1939. Since then two noteworthy reports have come from his pen, in that he was chairman of both committees; both outgrowths of World War II: Report of the Technical Committee on Forestry and Primary Forest Products, to the United Nations, April, 1945; and *Problems and Progress of Forestry in the United States*, published by the Joint Committee, National Research Council and Society of American Foresters, 1947.

Because of his life, his character, and his accomplishments it may truly be said that Henry Solon Graves represented the best and finest in American Forestry. Let us remember and be grateful that our profession in the United States has had the guidance of such a man.

RALPH S. HOSMER, *Fellow.*

Future Wood Markets and Forest Management

John A. Zivnuska
Assistant professor of forestry, University of California, Berkeley.

The forest crops which foresters produce must be aimed toward future, not present, markets. This paper analyzes the problem of wood markets, develops long-term speculations, and illustrates the relationship to the objectives of forest management.

FORESTERS are engaged in the production of crops which may require more than a century to mature. Actions taken currently which are related to technical forest management require decades to produce their full effects. Thus any such actions necessarily involve some assumptions, whether they are made consciously or not, as to economic conditions in the very distant future. As a result long-range economic speculations are an essential part of the forester's job, since it is such speculations which must determine his basic objectives in management.

Patently, long range forecasting of this sort is subject to a wide limit of error. Looking back one hundred years we find that in 1850 the very idea of making paper from wood was not known. Today pulpwood ranks second among all forest products from the standpoint of total value and is a major factor in the thinking of most foresters. What forester or economist—if either such type of specialist had then existed—could possibly have foreseen the present market for this product?

The reproduction which we now seek to obtain will in many areas not mature for one hundred years into the future. Revoluntionary technological changes at least equal to those which have occurred since 1850 can surely be expected before 2050. But while we cannot hope for accuracy, we can at least carefully consider possibilities.

In general, American forestry, and particularly western forestry, has been sawtimber forestry. Lumber accounts for over half the cubic volume of timber cut, and for a far higher percentage of its value. Fuelwood accounts for about one-sixth of the cubic volume, but is obviously of minor importance in the market for stumpage. Pulpwood shares honors with lumber as a major commercial product, but takes only about one-fifth of the volume and considerably less of the value represented by sawlogs. Ties, poles, piling, veneer logs, and similar products provide valuable supplemental markets, but they are essentially by-products of sawlog forestry.

Thus long-term speculations must deal primarily with the future market for lumber. However, brief consideration will be given first to pulp and certain other products which are sometimes suggested as the key to the future of forestry. At this point such discussion will be limited to the context of known technological processes and trends.

Wood Pulp

The steady rise of the American paper industry has been spectacular. For nearly a century and a half the per capita consumption of paper has doubled every twenty years. The industry has a sound research program, skilled engineering, and aggressive promotion. A continued expansion of production appears probable. However, even if such expansion should extend to another doubling of paper consumption (at which point we would be consuming paper at a rate approaching two pounds per day per capita) it could be wholly offset in its effect on the volume of wood consumption by a decline of one-fifth in lumber consumption.

Moreover, the pulp and paper industry cannot be considered as an outlet for high priced stumpage. The technological history of the industry is one of escape from rising raw material costs to other, cheaper materials. This is exemplified by the shifts from New England spruce to Lake States spruce, then on to southern pine and western hemlock and fir, and now on to aspen and other scrub hardwoods as well as to tops, slabs, edgings, and other forest and mill waste. Estimates of the amount of pulpwood which could be produced simply as an incident to lumber production if the two industries were fully integrated range from the equivalent of 26 million cords (*2*) to as high as 50 million cords (*3*). During recent years the U. S. consumption of domestic pulpwood has been running slightly under 20 million cords annually.

In Great Britain much of the paper is made from esparto grass; in India bamboo—also a grass—is the mainstay of the industry. In every country the comparative costs of collecting and transporting the raw material are the prime determinant of the pulping material. It is safe to predict that high cost stumpage will not be used in large volumes in the manufacture of pulp.

Much publicity has been given to such wood-derived materials as fabrics, plastic dishes and children's toys, and cellophane. What do all such goods mean to foresters, to producers of wood?

Rayon and the various wood-derived plastics are made from pulps whose alpha cellulose content has been raised to 90 percent or higher. In 1949 the production of this purified wood cellulose amounted to 3 percent of the total wood pulp production in the U. S. Thus an increase of 400 percent in the production of such goods would increase total wood consumption by only 1 percent. Actually there appears to be no reason to predict any great increase in this field. During the period 1947-49 the consumption of cellulose plastics dropped 38 percent although during the same period total plastic consumption increased 27 percent (*1*). Rayon uses about two-thirds of these purified pulps, but the increase in synthetic fabrics, paricularly nylon, orlon, and glass (none of which is wood-based), suggests that increased competition will act to limit any further market expansion here. And rayon can be manufactured equally well from cotton linters. The proportion of these two materials which is used is very sensitive to relative costs.

Wood Hydrolysis

Wood hydrolysis has sometimes been suggested as a potential quantity market for wood. This is

the process by which wood sugars are derived from wood. Through fermentation of these sugars it is possible to derive a variety of chemicals. Such processes are well established in Europe.

In the United States the only commercial attempt in this direction is the federally constructed alcohol plant at Springfield, Oreg. According to U. S. Forest Service studies, to produce alcohol at competitive prices the plant cannot pay more than $1.50 to $2 per ton dry weight delivered for its wood (*7*). At 5 cents per ton-mile for hauling, a truck haul of 30 miles wouldn't leave much for handling charges, to say nothing of a contribution to stumpage.

It is obvious that any adaptation of known processes of wood hydrolysis must be based on extremely low cost wood to become a quantity market.

Lumber

The general historic pattern of lumber production is well known. Throughout the nineteenth century the lumber industry experienced a sustained and rapid expansion. By 1906, production had reached 46 billion board feet, representing a per capita rate of 523 board feet. Then this century-long expansion came to a crashing halt and was replaced by a steady, deadly decline. The building boom of the 'twenties caused a brief upsurge in production, but the following depression brought production to a low of 13.5 billion feet in 1932, giving a per capita rate of 108 board feet.

Some improvement was then experienced, but during the last half of the 'thirties production averaged only 26.6 billion feet per year. The prospect of a continued downward trend was fairly widely accepted. However, during the first four years following World War II production averaged a healthy 35.1 billion feet annually. In 1950 production seems headed toward a twenty-five year high. Soaring prices and a high rate of production have even led to some discussion of the possibilities of a 40 billion foot year.

Before drawing any conclusions from this expansion of production during the last decade it may be well to analyze more carefully just what has happened. The fact that production in 1949 amounted to only 228 board feet per capita—a 56 percent decline from the peak of 1906—is in itself a fact worth considering.

A few statistics will serve to summarize the experience of the last decade. Lumber production in 1939 was 28.7 billion feet, a per capita rate of 220; in 1949, 34.3 billion, a per capita rate of 228. Comparing 1949 with 1939 we find that lumber production increased 19 percent. On the same basis:

a. Population increased 15 percent.

b. Number employed in civilian labor force increased 28 percent.

c. Physical volume of farm marketings increased 35 percent.

d. The number of new, permanent, non-farm dwelling units started increased 99 percent.

e. The floor area of residential building contracts authorized, 37 states, increased 57 percent.

f. The floor area of non-residential building contracts authorized, 37 states, increased 92 percent.

g. Production of furniture increased 41 percent.

h. Industrial production increased 62 percent.

i. Production of iron and steel increased 64 percent.

j. Production of cement increased 73 percent.

Seen against this background lumber's increase of 19 percent is something less than impressive. It is readily apparent that the consumption of goods in which lumber could be used has increased much more than has the consumption of lumber. In other words, for all the increased production and considerable prosperity in the lumber industry during the past decade, the period has been one of definite and even rapid displacement of lumber in its traditional markets. Lumber production has been carried upward by the tremendous increase in general economic activity, but has not shared fully in the expansion. The relative trends in lumber consumption appear to be downward Once this stimulus of economic expansion is removed or even is applied in moderate instead of massive doses, it is probable that the downward trend will be readily apparent.

Some confirmation for this view is furnished by the experience of the first nine months of 1949, a period of brief pause in the phenomenal post-war expansion of the economy which has now so unhappily merged into a pre-war expansion. Comparing this period with the corresponding period of 1948 shows that the gross national product excluding inventory changes increased 3.6 percent; that the square footage of construction contracts in the 37 eastern states declined by only 1.4 percent; that industrial activity declined less than 9 percent; and that the apparent domestic consumption of lumber decreased 13 percent!

These indications of lumber's poor showing give rise to some important questions: Why? What are the factors that explain it? Will these factors be important in the future, or is stabilization of lumber's position probable?

To answer these questions we must look to the various uses of lumber. Nearly three-fourths of total lumber production is ordinarily used in some form of construction, with the remaining consumption being divided roughly between shipping use and manufacturing. The construction of new residential buildings, which now may require something over one-third of total production, is the most important single market for lumber. Many of the factors affecting lumber use in residential building are also common to the other construction uses of lumber. Thus by giving primary attention to residential housing use and supplementing this by consideration of any special characteristics of other uses, it should be possible to develop the problems involved.

Use in Construction

In 1947 the Department of Commerce (*6*) made a study of the cost of an average house, typical of nation-wide construction practice. It was found that in 1947 the cost of such a house was $9,060, while in 1939 it had been $4,440. The break-down of costs given showed that lumber represented 26 percent of the cost, other materials 22 percent, and labor and profits 52 percent.

For the consumer interested in getting more living space for his construction dollar, this suggests at least two possibilities. One is to attempt to reduce the lumber bill, either by getting cheaper lumber

or by using a less expensive, alternate material. The other, and perhaps the more promising, is to attempt to reduce labor costs, either through improved techniques in the use of existing materials or through the use of alternate materials requiring less labor. This, too, may affect lumber.

Thus there are two aspects to the cost of lumber which should be considered: the cost of buying and the cost of using.

The record of the cost of buying lumber is clear and well-known. The following ratios of wholesale prices, 1949, to wholesale prices, 1939, are illustrative:

a. Lumber	3.06
b. Cement	1.47
c. Brick and tile	1.77
d. Iron and steel	1.73
e. Paper and pulp	1.95
f. All commodities	2.01

When it comes to the cost of using lumber, there is no such readily available statistical evidence. However, consideration of the various uses in which lumber has been partially replaced in the construction of residences and other small buildings leads to the conclusion that in almost every case the use of the alternate materials involves a reduction in on-site labor—the biggest element in building costs.

Indeed, it is probable that one of the most promising and economically important fields of research and engineering development for the lumber industry is in the development of techniques and types of products which will lower the cost of using lumber. Much of the existing research, however justified in itself, has been concerned with specialty uses rather than with the biggest problem of the industry—an assured *volume* market for the great quantities of medium and low grades which form the industry's main output. In this connection, it should be emphasized that the inadequate financing of research in the lumber field, amounting to far less than 1 percent of the value of the product as contrasted with research investments of up to 3 percent of the value of the product for some of the competing industries (*4*), deserves considerable weight in any speculations as to long-term prospects.

Various statistical studies have shown something of the results of a combination of cost and technological competition on the use of lumber in building. For example, Vaux and May (*8*) found that "total lumber requirements for the average single family home in California declined about one-third between the early 1930's and 1946." They also found a reduction in cubic volume of the average home of about 20 percent. This reduction in size, which was clearly cost-inspired, is undoubtedly the most important single factor contributing to the reduction of lumber consumption per living unit in recent years. However, there are obviously a number of other factors involved. A consideration of changes in building techniques over the last 10 to 20 years is enlightening.

In regions in which sheathing is used in home construction, wood sheathing has been replaced by fiber-board to a large extent. Wood lath has largely disappeared. Masonite, asphalt tile, and various linoleum floorings are receiving increasing acceptance. Concrete subflooring is becoming common. Aluminum has become an aggressive and important competitor in the sash and door field. Aluminum siding is being actively promoted, while in rough construction the use of corrugated and sheet aluminum is common. Even in the wood exterior houses the trend toward increased window areas has had a significant effect on the bill of materials.

It is also worth noting that inroads have been made on the once basic field of wood-framing in construction. In 1946 in California about 10 percent of the new homes built were of non-wood-frame construction. Almost all these were concrete block or Quonset-type structures—then radically new building techniques. A continued expansion of this type of construction is probable.

It is true that in a number of cases disappointments have resulted from the use of these alternate materials. It is also true, however, that in many of the poorly built structures of recent years lumber, too, has not infrequently made a poor showing. Without question, continued improvements in the characteristics and techniques of using these alternate materials will be made. In addition, materials not now used in building or perhaps even not now known will be developed and adapted to building. Increased rather than lessened competition with lumber over the coming years appears certain.

A basic problem confronting the lumber industry in meeting this competition of alternate materials lies in the fact that it is producing increasingly higher proportions of the lower lumber grades and the less desired species. This trend has been evident for many years and its continuance in the future can be expected. The source of this problem is in the raw material base. This point needs no support from timber famine scares nor even from Reappraisal statistics. It is evident in the output of the industry, in the composition of our forests, in the differences between old-growth and young-growth stands.

It is true that the common grades and less desired species are as satisfactory as the better grades and preferred species if properly used with adequate recognition of their characteristics. However, it is necessary to sell this idea to the consumer. This is a selling job which the lumber industry with its thousands of producers and somewhat casual trade practices is ill-equipped to do. And at best this is just a matter of "as good as" rather than the more positive "better than."

In short, to compete technologically the lumber industry is faced with a tremendous undertaking. And there would still remain the problem of competing in terms of cost.

How successful the industry will be in rising to meet this competitive challenge is necessarily a matter for individual opinion. However, it can be pointed out that the economic characteristics of the industry are such as to handicap it in the competitive struggle. Particularly pertinent in this connection are the large numbers of producers, the traditional distribution

system, the ownership pattern of the forest land on which the industry is based, and the extreme variability characteristic of its product. It might almost be said that intra-industry competition is too extreme to permit effective inter-industry competition.

Thus it is the writer's opinion that the trend in the consumption of lumber in construction will continue to be downward, even in the face of the continued expansion of the American economy.

Shipping and Manufacturing

The same general situation seems to prevail in the other uses of lumber. In shipping, the cost of use has been particularly telling. Reduction in shipping weights and thus in costs is a major consideration. The increase in trucking and loose rail shipments and the substitution of fiber and veneer packages for wood boxes and crates have acted to reduce the market for lumber. Except in a war economy with its peculiar shipping requirements, agricultural products are the most important market for shipping lumber, using about one-third of the total. Recent trends in this field such as the use of pre-packaging and frozen foods appear unfavorable to lumber.

Use in manufacturing has long been marked by a downward trend with almost complete loss of such fields as vehicles, agricultural implements, and refrigerators having occurred some time ago. Furniture is the dominant manufacturing use, consuming about half of all lumber used in manufactures. Here the earlier trend toward replacement of wood by metal in office and store furnishings has continued to the point where it is substantially complete.

Household furnishings, however, are the backbone of the industry, amounting to around four-fifths of its output. Here lumber's showing has been better—yet even here the last decade has resulted in lumber's relegation to a very secondary position in the fairly important group of kitchen furniture and in the less important field of outdoor furniture.

There appears to be reason to hope that lumber can maintain its position in manufacturing use. However, many of the recent developments in wood technology are particularly pertinent to this general field of use and may be expected to enable the substitution of less expensive species for the currently highly expensive specialty woods.

Age of Wood?

There is one other point that should be raised concerning lumber—a point that is on a very different analytical level than the preceding discussion. In the usual process of lumber manufacturing only one-third of the cubic content of the tree is utilized in the final product. The remaining two-thirds is either inefficiently burned as fuel or is not used at all.

From the engineering standpoint this process is obviously not efficient. The material not utilized differs only in size from that which is. Efficiency in use of raw materials is not compatible with discarding two-thirds of the substance. Furthermore, the sawing of lumber places a definite limit on the maximum size of the individual units which can be produced. This requires an expensive mechanical bonding of the pieces by means of nails, screws, glues, or other connectors in order to produce units of the size needed in use.

Thus both the nature of the raw material and the nature of the final products desired exert a compelling drive in the direction of a manufacturing process which involves some breakdown and reconstitution of the wood elements. The great advantage which natural wood now has over the various reconstituted wood materials lies in its strength in compression. The answer to this lies partly in structural design, partly in the development of new techniques in orienting and bonding the basic wood fibers.

Once size is dropped as one of the criteria of wood as a raw material the enchanting vista of a coming age of wood may begin to appear on the horizon. The prospects and possibilities of such an age have nowhere been more glowingly described than by Egon Glesinger (*3*) in his recent book. However, in an economic world, considerations of cost as well as those of technology must be faced if such dreams are ever to have substance.

In an advancing technology a great many hitherto unsuspected raw materials may be found susceptible to a variety of treatments. Relative cost will then enforce its decisive role.

The wood fibers themselves consist of complex polymer structures of carbon, hydrogen, and oxygen. Various polymers of these three elements provide food, shelter, clothing, and many of the other essentials and luxuries of life. These three elements are everywhere abundant. The basic long-term question which will determine the nature of technological developments is the relative cost of combining these elements into polymers of the desired characteristics by alternate techniques.

In a recent discussion of cellulose as a chemical raw material E. A. Tippetts has brought this point out clearly, as follows:

> The pulp manufacturers must look upon themselves as polymer manufacturers in strong competition with a dynamic synthetic polymer technology which is based on fundamental studies of the chemistry and physics of the processes and intimate knowledge of the effect of polymer structure on the final product. Nylon, "Orlon" acrylic polymer, and other man-made fiber and film polymers yet to come are, and will be, tailor-made with respect to purity, chain-length distribution, distribution of substituent groups along the chain and in other characteristics, to impart desired functional characteristics to the final product. Cellulose is still characterized in terms of strictly empirical tests. . .
>
> The chief virtue of cellulose as a polymer is its relatively low cost compared to other commercial polymers. This favorable position, too, must be maintained and if possible improved. As the synthetic polymer industry develops, this will be increasingly difficult. (*5*).

Objectives of Forest Management

If the points developed in the preceding discussion can be accepted as premises—and admittedly they are subject to challenge—then some fairly definite conclusions as to the general type of forest management which should be practiced can be reached.

The argument to this point can be briefly summarized as follows: Lumber consumption is not likely

to stabilize at present levels but will decline. The higher its price, the more rapid the downward trend will be. Known technologies in pulping and wood hydrolysis are not likely to take up the full slack in volume of wood consumption resulting from lumber's decline. Further, these processes are predicated on lower cost wood than is lumber production. Thus the market for high priced wood will contract. There is, however, at least some reason to believe that a technological revolution could occur based on the use of the forest as a source of two raw materials—plant fibers and cellulose molecules. For this to be considered as even a remote possibility, however, the forest must be a low-cost source of such materials.

The primary conclusion for the forest manager is that in time the market for high priced stumpage as it is now known will be very limited. The point here is not that high priced stumpage causes high product prices. Actually, the reverse is true. High stumpage prices are much more an effect than a cause of high product prices. Only high priced products can afford to pay high stumpage prices.

It may be argued that since stumpage is a relatively minor component of the retail price of most wood products, such prices could decline or be kept low without resulting in a decline of stumpage prices. But while mathematically this is conceivable, it is not at all probable. Known technological patterns in manufacturing and trends in labor costs indicate that these factors are more rigid than is stumpage. In the short run—and sales are always made in the short run—the supply of stumpage is quite inelastic. That is, changes in price occur more rapidly than do changes in quantity.

If this is correct, and the market of the future will be a low price market, then the forest manager must keep his costs per unit volume down. This means concentrating on quantity, not quality. For example, in considering reproduction the percent of stocking, not the species composition, should be the prime consideration. And if the future market is a fiber-wood-cellulose market, it is obvious that the attributes of quality stressed by sawlog forestry will be of little importance.

It should be noted that this does not necessarily mean a very extensive type of forestry. Thinking in terms of costs per acre makes no sense no matter what the future markets. The pertinent question is costs per unit volume of marketable material. A good case can be made for the view that in many instances spending more per acre would result in spending less per unit product.

Such management can succeed only if there are major changes in the organizational as well as the technological aspects of the forest industries. With a low price per unit volume of wood appearing in the final product, it is essential that all the wood grown be used. If, instead of selling one-third of the tree's volume at a high price per unit, it is possible to sell all the volume at a lower price per unit, then forestry can still be made to pay.

In other words, integrated forest industries are an essential of any large scale commercial forestry in the future. Correspondingly, forest properties must be so blocked and managed that a sufficient supply of raw materials is available within the radius of low transportation costs to support the integrated industries.

Thus the economic future of wood, if it is to have one at all on any large scale, will be as a low cost, large quantity, basic raw material for conversion by integrated industries, with the whole forming a vastly more complex, interdependent, closely knit, and large scale type of organization than we are now generally familiar with in the field of forestry and wood products.

This, however, is a picture of a rather distant future. The arguments should not be overstated. There is no reason to anticipate any early or sudden collapse of the lumber market, but only a steady downward trend. Similarly, the possible technological revolution, if it occurs, will appear to be more a technological evolution as it is experienced.

It is quite possible that in a number of areas the decline in demand for high quality sawlog stumpage will be less rapid than the decline in supply. Thus in the near future a continued upward trend in stumpage prices for such timber is probable.

In addition, the great population movements which are occurring will have considerable influence on regional demand. This point is particularly pertinent in regions such as California where the vast expansion in population is one of the dominant factors of the economy. This rate of increase in several areas is sufficient to offset even a considerable decline in per capita consumption.

Recognizing the influence of both of these factors it seems safe to predict a continued upward trend in stumpage prices in California for the next two or three decades.

Thus these speculations as to future wood markets indicate that the objective of management of stands approaching harvest size in the next twenty to thirty years should be quite different than the objective in the reproduction of stands and handling of very young stands. For the near future (near in the forester's sense) investment in quality as we know it may be justified, but for the forests of coming generations the twin guides should be quantity and low cost.

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Release of Sand Pine Seed After a Fire[1]

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THE ONLY LARGE CONCENTRATION of sand pine, *Pinus clausa* (Englm.) Vasey, in the world is a block of about 210,000 acres in the Ocala National Forest in north-central Florida. Locally, it is known as the "Big Scrub." Much smaller stands occur in a few other places within the Florida peninsula. Pure stands of this species (Fig. 1) also grow on many off-shore islands as well as on parts of the coasts of Florida and Alabama. Its occurrence is limited to deep, dry sands of the St. Lucie and Lakewood series.

The Ocala sand pine area could provide a supply of 35,000 cords of pulpwood annually, except that adequate reproduction is obtained only in stands killed by fire, and has not been obtained after any known method of harvest cutting or post-logging treatment. If commercial utilization is to continue, some method of regeneration less destructive than fire must be found for this little-known but locally important species.

The cones of sand pine are persistent, and in the Ocala area they seldom open on living trees. As a result, very few seeds are dispersed naturally at any time of the year. Some seeds within the tightly closed cones remain viable for at least five years; consequently, a large quantity of good seed is available at all times. A test in January 1950 disclosed that persistent cones of the past five crops contained seeds that were respectively 85, 46, 42, 37, and 18 percent viable, the highest percentage being found in the most recent cone crop. When a killing fire occurs, the cones of the fire-killed trees (Fig. 2) open and release the tremendous quantities of seed stored on the tree. The seed is protected from the flash heat of the fire by thick cone scales. If conditions are favorable, a dense stand of seedlings soon appears.

Efforts after harvest to obtain adequate reproduction without destructive fires have not been successful, but some post-logging treatments have aided reproduction to a limited extent. Burning the slash after logging has been of little help because the seed are consumed. Lopping and scattering the tops of harvested trees permit many cones to open and considerable seed are released, but resulting reproduction usually is sparse and spotty. Disking, before or after cutting, has helped somewhat, but has not come close to duplicating the effect of wild fires. Man's efforts to date have failed to produce 1,000 well-distributed seedlings per acre, which probably will be needed to stock a new stand satisfactorily. Hence, attention has been turned to a more thorough study of natural regeneration.

One of the first steps in this study has been to observe seedfall and germination after a fire. On February 19, 1950 a wildfire swept through about 200 acres of an even-aged, 40-year-old stand of sand pine in the Lake Doerr area of the Ocala National Forest. The fire was hot enough to scorch the needles and kill the trees.

Seed traps, each with a surface area of $\frac{1}{8}$ milacre, were set out 24 hours after the Lake Doerr fire. Two traps were placed in a dense stand and two in an open stand. Seed counts were made 1, 7, 17, and 21 days after the fire. On the first day, counts were made of the seed in sample plots on the ground at the time the traps were set out. Each collection of seed was tested for viability using petri-dish germination tests. These collections were followed by periodic inspections to observe the progress of regeneration and changes in environmental conditions.

Seedfall began less than 9 hours after the fire, and at the end of 3 weeks about 1,092,000 seed per

[1]This study is a part of a research project on sand pine regeneration conducted by the Southeastern Forest Experiment Station and the Ocala National Forest.

FIG. 1.—With protection from fire in Florida's "Big Scrub," mature stands of sand pine like this one are being grown primarily for pulpwood.

FIG. 2.—Occasional fires kill stands of sand pine, but heat from the fire opens the cones. Viable seed for regeneration are promptly released.

acre had fallen in the dense stand (Fig. 3). In the open stand, approximately 420,000 seed per acre were released during the same period of time. Forty percent of all the seed falling were viable, but seed falling during the first week were of better quality than those which fell later. Seed dispersal appeared to be almost completed by the end of the third week, when the traps were removed to avoid damage from a salvage cutting operation.

Germination was first observed on April 12, 1950, 50 days after the fire. Examinations on April 25 indicated approximately 1,000 sturdy seedlings per acre. However, by May 20 the entire crop of reproduction had been wiped out. High surface soil temperatures and drought during this interval probably accounted for their deaths. Rainfall during a 30-day interval in April and May was less than ½ inch, and the soil surface temperatures were as high as 150 degrees F. The low vegetation had not grown enough to provide much shade, and shade from dead trees was reduced considerably when the pulpwood cut was made.

After the first wave of seedlings had been wiped out, almost no seed were visible on the surface of the ground but the presence of buried seed in the soil was suspected. An estimate was made of the number of buried seed per acre from data on four 1-milacre sample plots in the dense stand. On each plot the soil was removed to a depth of 1 inch and passed through a screen to separate the seed. Seed counts showed that about 269,000 seed per acre were in the soil 3½ months after the fire. A cutting test revealed that only 14 percent or about 37,000 seed per acre were sound. The limited samples obtained in this study indicate that over 90 percent of the viable dispersed seed were not accounted for 3½ months after the fire (Table 1).

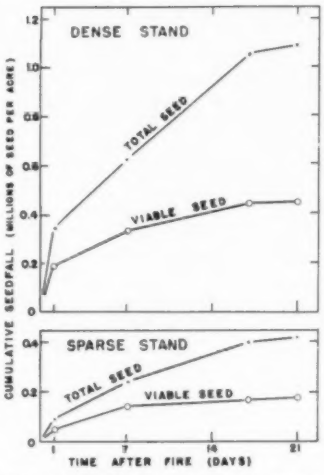

FIG. 3.—Seedfall in dense and sparse stands of sand pine after a lethal fire.

The seed not accounted for include those consumed by ants, birds, rodents, and those which may have lost their viability as they lay on or in the ground. Observation indicated only a small loss to rodents and ants. The loss to birds probably was large, since many birds were seen on the burned area. Doves, chewinks, and blue jays were the most prevalent.

Nearly all the seed recovered after 3½ months were buried in the sand. This may be nature's protective technique, brought about by the action of wind and rain. With such protection, seed probably have a better chance of escaping destruction until time of germination. On the other hand, some of the seed may be buried too deep to germinate.

The story is by no means complete. No new sand pine seedlings were found on this area five months after the fire. The big question now is when will we get reproduction, if ever. Inhabitants in and around this sand pine forest say that the "Big Scrub" always comes back after a spring fire, but they do not know how long it takes. Continued observations on this area are expected to provide the answer.

TABLE 1.—RECOVERY OF VIABLE SEED 3½ MONTHS AFTER A FIRE

Item	Approximate number of seed per acre	Percent of total
Germinated seed, 2 months after fire	1,000	0.2
Viable seed present in soil, 3½ months after fire	37,000	8.2
Unaccounted for	410,000	91.6
Total number of viable seed released	448,000	100.0

Black or Speckled Alder?

While teaching for the Pennsylvania Game Commission at its training school at Christmas time, I stumbled upon, what I believe to be, an authoritative way to distinguish between the black and speckled alders in winter. The books are pretty vague on winter differences, and it is almost impossible to differentiate between them in all kinds of weather. I discovered, by accident, that the pistillate catkins of the black resemble unripened red mulberry fruits, while those of the speckled look like partly opened pine cones. This holds true for nearly 400 specimens of each from different parts of the state.

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Professional Needs in Forestry Education

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FOR NEARLY THREE YEARS the writer has had the privilege, as chairman of the Society of American Foresters Committee on Accrediting, to view, analytically, forestry education throughout the United States. Now, that the main task on current accreditation has been completed, seems an appropriate time to express a few opinions concerning forestry education in the hope that these opinions will lead to vigorous discussion on the subject and that the discussion in its turn will point up and bring about desirable improvements in the training of professional foresters. However, the opinions expressed by the writer should be interpreted as his own and as not expressing, necessarily, the viewpoints of any of his colleagues on the Committee on Accrediting.

It is evident that we are now in a period when, in all forest regions of the nation, there is an acute interest in the maintenance of the productivity of our timber stands. Much of this interest has been generated by a marked increase in stumpage values, an increase which makes the growing of timber decidedly attractive. But whatever the cause, the interest is likely to remain and increase in its intensity. It is up to the professional foresters to translate this interest into realization. Therefore, all of us as professional foresters and, in particular, those of us who are in the field of forestry education, need to examine the sort of training that is being offered in preparation for the professional practice of forestry.

Is the training being offered to the young men now in our professional schools adequate to meet the stage of professional development which will apply ten to fifteen years hence when these same young men will have just begun to hit their stride as practicing foresters? What are some of the earmarks of sound professional training? Are certain types of institutions better adapted than others to the offering of professional training? What should be the qualifications of a good forestry teacher? What are the financial requirements for the offering of adequate forestry training? What are the essentials of curriculum content for forestry training on the professional level? These are some of the questions which can and need to be analyzed and discussed at this time.

Forestry education in the United States got under way at the turn of the century. During the first decade there was nothing particularly wrong with the subject matter covered in a typical forestry curriculum from a professional standpoint. It was evident immediately, however, that the professional training, based as it was on the training in Europe, was not a commodity which enjoyed high demand on the part of employers. Even in the United States Forest Service there were many examples of eager, earnest young forestry graduates being buried and forgotten in some premature technical study or in the preparation of an unused management plan.

To provide better opportunity for the employment of their graduates, or perhaps more precisely to fit their graduates to the then existing stage of American forestry, several forestry schools turned to specialized curricula in logging engineering beginning with the second decade of forestry education. This training did provide men who could offer better assistance in the problem of converting timber stands to lumber. Later, for the same basic reasons, there emerged such other courses and curricula as range management, forest products, wildlife management, municipal forestry, and recreational forestry.

This somewhat opportunistic approach to forestry education has had its good points, but it has also resulted in some rather fuzzy thinking as to what the profession of forestry really is and what the essentials of good forestry education should be. This discussion of forestry education is predicated on the assumption that forestry as a profession is concerned with the production of crops of timber. The forestry student obviously needs to acquire some knowledge of the relationship of his chosen profession to the other soil-using professions or fields and to the timber conversion processes, but his training should give strong emphasis to the growing of stands of timber, that is, essentially, to the physical and biological factors of soils—tree relationships as modified by economics. This should be the objective of forestry education.

Institutional Status

One of the criteria established by the Committee on Accrediting to evaluate forestry education is "Institutional Status." In this the commitee had two things in mind: (1) that the institution in which forestry is offered be of true university caliber, and (2) that the head of the forestry department have the same administrative status as the heads of other professional departments in a given institution.

Probably from a justifiable professional pride, we are too prone to overemphasize the latter point and underemphasize the former. If an institution has strong departments in such basic fields as botany, English, mathematics, physics, chemistry, soils, and economics; and if forestry is forced to stand in comparison with other professional fields, such as architecture, engineering, business administration, and law, the forestry curriculum is likely to be strong regardless of its place in the administrative setup. There is no intent of minimizing the importance of relative administrative status. Forestry is entitled to just as dignified a position in the university hierarchy as is any one of the other professions. The point to be emphasized, however, is that in a strong university, the forestry curriculum, even though, for example, under the college of agriculture, can and probably will represent better instruction than a forestry curriculum in

a separate college of an institution which does not have either strong basic departments or a good representation of professional departments.

The Society of American Foresters should do everything possible to discourage additional curricula on the professional level in those institutions which cannot be described as of true university caliber. This would constitute one important step in assuring a continuous flow of strongly trained young men into the profession.

Qualifications of Teachers

Teachers are the backbone of any curriculum. In a professional curriculum the instruction cannot be better than the professional quality of the instructors. In this respect forestry is no exception. The members of a forestry faculty have three obligations. They must offer sound, systematic instruction; they must keep abreast of professional developments in their fields; and they should pass on to the succeeding generation of foresters at least a small contribution to the sum total of knowledge in forestry.

From the standpoint of the professional training of forestry instructors most of the emphasis at present is on the third of these obligations, more commonly called research. The Ph.D. with its emphasis on training for research has become the "union card" for employment in most institutions. Certainly, if teachers of forestry are to hold their own with the other teachers of an institution, they must offer as thorough an academic foundation. The forestry profession can be proud of the academic status and the research accomplishments of many of the young men now engaged in forestry teaching.

But how can we continue this aspect of faculty strength and at the same time be assured that each forestry faculty, collectively, has had substantial, first-hand professional experience? After all, a preponderant percentage of the young men who pass through our forestry schools will become practicing foresters rather than research workers. Perhaps the professional aspect of forestry teaching can be kept in proper relationship to the research or academic aspect through the maintenance of better balance on each forestry faculty. Cannot a few members of each forestry faculty be expected to offer five or more years each of professional experience in addition to the Ph.D. or at least in lieu of that training? Or perhaps greater use should be made of the professional doctorate in preparing some men for teaching.

Another possibility is to insist that the young teacher utilize the summers during the early years of his teaching to obtain professional experience. This is a rather dangerous suggestion in that part-time outside employment is implied. While professional employment can be a real asset to a teacher, the privilege can be so easily abused that a few institutions prohibit the practice. Interregional exchange professorships, and more frequent use of sabbatical leaves are other possibilities for strengthening professional practice. Finally, a more radical departure would be "clinical professorships" on each forestry faculty, filled for periods of one year each by men who have been tried in the fires of several years of making forestry work in the woods.

Forestry is a live, pulsating profession. If young, budding foresters are to be adequately trained, that training cannot continue to be offered so largely by men, who, by the very nature of their backgrounds, are chained to academic viewpoints.

Attributes of a Forestry Curriculum

Given both a strong institution and a strong, well-balanced forestry faculty in all of the aspects previously discussed, a good curriculum in professional forestry is likely to result. However, in the historical development of curricula, we may be prone to continue courses that have long since ceased to be appropriate. Or if the courses, by name at least, are appropriate, we may have failed to make changes in emphasis to correspond with the changes in professional practice.

For purposes of illustration, a change that comes to mind immediately is in the field of logging. For many years logging has been purely an extractive process. During this period it was quite logical for forestry school courses in logging to emphasize the engineering aspects. To an ever increasing number of timber operators, logging is now becoming an integral part of the complete practice of forestry. Therefore, in the logging courses of our forestry curricula there must be less emphasis on engineering and greater emphasis on the relationship of logging machinery and methods to the practice of forestry. If we as forestry teachers are to give adequate training in logging, our objective must be away from the mere training of engineers who are to work in the woods and toward the training of foresters who will know how to utilize machinery in the more economical accomplishment of proper forest management. A like analysis of objectives is required for all other forestry courses.

At the outset of forestry education in the United States, the foundation of our professional courses was largely empirical. During the past half-century there has been a pronounced development in the science of both soils and plants. In our professional forestry courses we must incorporate much more of this material. Our training in silviculture, for example, must be a harmonious blending of the science of soils, plant physiology, and plant ecology. Some of our younger foresters would add genetics to this list. Regardless of the component ingredients, the blending must not be a mere theoretical blending, it must be a blending that will work in the woods.

It is our responsibility as forestry teachers to make the scientists and teachers in the fields basic to forestry aware of the applications in the field of forestry so that the courses in soils, plant physiology, plant ecology, and genetics will be natural, easy stepping stones to those professional courses in forestry to which they are basic.

In the long run this liaison between the faculties in forestry and the faculties in basic departments should result in greater curriculum strength than if the forestry faculties attempt to provide their own coverage in these fields.

Forest economics has always been considered one of the five key fields of forestry. As a course in a curriculum, however, there has been no clear-cut definition of just what should be covered. Among the forestry schools of the United States the term "forest economics" at present is being used to designate forest finance at one extreme and forest policy at the other. While these are certainly part of the broad field, there is gradually emerging a concept of forest economics as consisting, in addition to elements of national policy, of the many complex economic factors which affect the production from a particular forest property, and, thus, of the relation of a particular forest property to our national economy. This concept of forest economics is being followed only at those institutions which have staff members thoroughly grounded in economics. It is a development which deserves the attention of all schools. Because of its nature the development is likely to be relatively slow in coming to full fruition.

Conservation

Another development which calls for the careful study of all forestry faculties is the increasing emphasis on "conservation" on the part of the general public. Basically, of course, forestry education has always emphasized sustained yield. This implies proper land use and therefore, in itself, is conservation. But in altogether too many instances, this is not the connotation placed upon the word by interested citizens. Perhaps because of too much misleading propaganda in the past, substantial segments of the public have come to regard all timber cutting by lumber companies as destructive and therefore would protect the public interest by preventing all such cutting. Even when representatives of the public take the viewpoint of conservation through wise use, they frequently think that some sort of special training for professional conservationists is necessary.

Several forestry faculties may be forced through public pressure to establish curricula in conservation. What the composition of such curricula should be or what the graduates of these curricula will do is still very hazy. Much study and discussion is demanded of all forestry faculties in an attempt to precipitate some information on the subject, more definite and substantial than we now have. Whether or not any forestry faculty is confronted with pressure to establish a specialized conservation curriculum, there is still an urgent need in every locality of guiding the thinking of the public along constructive lines. If the conservation programs fall largely into the hands of those who view "use of resources" and "conservation of resources" as being diametrically opposed, there will be an inevitable muddying of the water and thus the work of forestry teaching will become unnecessarily difficult.

Field Training

Perhaps no phase of forestry teaching is more badly in need of study and reevaluation than field work, whether it is offered in connection with classroom discussion or concentrated at a forestry summer camp. Fundamentally, field work is just as essential to the training of a forester as hospital work is to the training of a medical practitioner. The field work involved in forestry may be classified into two broad types: (1) the teaching of the techniques related to specific fields of subject matter, and (2) the teaching of forest management, viewed in its broadest sense.

In teaching such courses as forest surveying, road location, and forest measurements, it is desirable only that the field work be practiced under forest conditions. For the techniques of these courses forest land anywhere is suitable, even though it be of a relatively small area. The point should be stressed that it is very easy to overemphasize this type of field work. The training is quite vocational in character and therefore much of it can and should be on-the-job training, following graduation.

However, in the teaching of forest management, viewed as inclusive of silviculture and regulation, it is essential that the forested area used for field work be under actual management and that the instructor have an intimate, firsthand knowledge of the management plan and its past history. In many instances these objectives can be achieved only through the direct ownership of a tract of timberland by the educational institution. In other cases equally good results can be obtained through cooperative working agreements with public or private owners of forest properties.

The essential point here is that the training of a forester cannot be completely rounded out merely by having him pursue some of his education out-of-doors. He must have the opportunity of instruction in a forest under technical management and from an instructor who has a high degree of familiarity with that management. It is this type of field training which should receive major emphasis in a forestry curriculum.

Specialized Curricula

One of the current controversial aspects of forestry is with respect to specialized or adjunctive courses. In large measure the differences in viewpoint as to the necessary diversification in courses stem from differences in viewpoint as to what forestry is.

Some foresters, probably most foresters, view forestry as the science and art of growing crops of trees for conversion into wood products; others view it as synonymous with wildland management. The latter consider that a forester is not adequately trained unless, in addition to the standard forestry courses, he has had also courses in range management, recreational forestry, wildlife management, and forest products. Still others think that, while the emphasis in training should be on the orthodox forestry subjects, certain individuals need at least a little

knowledge concerning the adjunctive resources. They view the amount and intensity of this specialized or adjunctive training as being dependent on the needs of the individual or the locality in which the forester will seek employment.

Nearly every forestry school has developed at least a few specialized courses. Several schools have expanded the offerings into a wide coverage of course material in one or more of the specialized fields, frequently at the expense of deleting forestry courses. Certain trends are becoming evident in the several curricula offered by "schools of forestry." Forestry, viewed as the production of tree crops, is itself becoming more intensive because more thorough training is required for the present stage of American forestry.

Range management and wildlife management are rapidly assuming all the attributes of separate professions. Forest products furnish the basis for a separate curriculum even though the curriculum may not be truly professional in character. Intensification of specialization in each of these three fields will undoubtedly continue.

It is inevitable in this development that forestry courses will be dropped from the specialized curricula to meet the professional requirements of these curricula. If forestry and each of the specialized fields is to be thoroughly grounded in the basic sciences and if the curricula are to recognize the necessity of some training in the humanities and the social sciences, the individual who aspires to complete training in more than one field cannot satisfy that aspiration without continuing his education beyond the usual four-year period.

Financial Requirements

Obviously, to establish and maintain a forestry curriculum with adequate equipment and a capable staff is going to cost money. Perhaps if more thorough consideration were given to this phase of forestry education prior to the establishment of a curriculum there would now be fewer forestry departments on a bare subsistence level or actually starving for want of financial sustenance.

The bedrock financial requirements for a professional forestry curriculum are as follows:

	First five-year period	Second five-year period
Capital investment	$47,000	$20,000
Annual expense:		
Faculty (five members)	31,000	33,500
Clerical staff (1)	3,000	(2) 4,500
Other items	11,000	12,000
Total	$45,000	$50,000

The figures in the foregoing table will of course vary somewhat with the locality. A student body of fewer than 100 students is contemplated. Again it should be emphasized that the amounts stated are a *bedrock minimum*. Any forestry school which does not move beyond the organization represented by these amounts, in a marked degree, by the beginning of the second decade cannot continue to give adequate training.

The figures given are predicated during the first five years on a staff with representation in each of the academic ranks from instructor to professor, with two men holding the professorship. During the second five years the promotional system should provide for the same men ranking from the assistant professorship to the professorship, with three men in the highest rank.

It is somewhat questionable whether with the present cost of living a high-grade staff could be recruited and maintained for the amounts shown. More realistic minimums for total annual expense for the two periods would be $50,000 and $55,000, respectively. Total annual expenses of $55,000 and $65,000 for the two periods would not represent extravagance.

In presenting the table above, the assumption is made that space charges are carried by the parent institution and that all basic courses will be offered by the supporting departments. The forestry staff will be concerned only with professional courses. It is assumed also that among the professional courses there will be an extremely modest offering in the specialized or adjunctive fields. Possibly the only offering in this area would be courses in wood technology and utilization. If there arose an immediate need for courses in range management and wildlife management, there must of necessity be at least one additional member on the staff.

No attempt has been made to estimate the cost of acquiring or maintaining a school forest. As was indicated earlier in this discussion, not every school will find the ownership of a school forest essential. For those schools which do find it essential, there will be a wide spread in the costs of acquisition depending on its location and stage of development. The net costs of operating the school forests will vary widely, as well, depending on the stage of management and the availability of good markets. Most forested areas within the financial means of a school will not become completely self-supporting until after many years of management. This constitutes an item of expense which in many cases would have to be added to the figures above.

If a start is once made in offering specialized courses, pressures for expansion into specialized curricula will develop inevitably. The development of curricula in range management and wildlife management could of themselves, at their inception, require a duplication of the above figures. The development of facilities and staff for a curriculum in forest products offers by itself possibilities in financial requirements greatly in excess of the figures shown.

Even if a school of forestry confines itself to the task of training men for the production of forest crops, it cannot keep abreast of professional developments under the financial requirements as stated. If the staff members are to have the opportunity to engage in research of worth-while magnitude, take sabbatical leaves, attend professional and scientific meetings, and otherwise devote themselves to their professional improvement, a larger staff must be recruited, certainly by the end of the first decade, even with the assumption that the student body does not increase

in size materially. This increase in staff would in turn call for larger expenditures for equipment and services. A total annual budget at the beginning of the second decade of $65,000 would be quite conservative, and one of $80,000 not at all extravagant.

Conclusion

Forestry in the United States is just opening up as a true profession. The level of the profession is going to be much higher ten and fifteen years hence. All professional foresters and certainly all forestry faculties need to reexamine thoroughly the nature and objectives of the forestry profession and what the emphasis in forestry education must be to achieve these objectives.

A forestry faculty which remains static must eventually lose out as an effective instrument of training. Institutions which establish curricula in forestry without envisaging the implications of this dynamic growth in all of its aspects will do the profession a real disservice.

We of the profession must in turn give these institutions every possible help in achieving desirable objectives. We have the opportunity now for a strengthening of forestry education. The problems are many but with a unified attack they are not insoluble.

Forest Fire Insurance in Norway

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The fact that a satisfactory solution of the forest fire insurance question has been achieved in Norway can be explained by the great interest manifested in forestry as a whole. Rational methods of cutting and provisions for regeneration of the forests are employed generally throughout the country. Especially since 1898, when the Norwegian Forestry Association was organized, a continuous effort toward better systems of forestry has been carried on.

Norwegian foresters were not satisfied, however, with increasing the productivity of the forests and growing new ones, but also took care that these newly created forest values should not be destroyed through lack of proper protection and that in case of fire the loss should not fall on the individual owner.

After considerable study and investigation, a program of forest fire insurance was drawn up, and in November 1911 was accepted by a large number of private forest owners. It was decided that the association should begin operations when a total amount of 30 million Norwegian kroner (at that time about $8 million) of insurance had been written. The sum was obtained and at a meeting held on February 20, 1912, the Norwegian Mutual Forest Fire Insurance Company (Det norske gjensidige Skogbrandforsikringsselskap) was organized. This is a mutual insurance company of which any forest owner, large or small, may become a member.

Being a mutual concern it follows that there are no stockholders. All surplus income is placed in a reserve fund, which tends to regulate the yearly premiums so that they can be kept relatively low. The direct objective of the association is to indemnify the loss which a private owner suffers when a forest fire ravages his forest. Besides this, it endeavors by all possible means to prevent fires and to control and put out those which may occur. The association has built many lookout stations and has assisted the forest administration in maintaining a protective organization.

All forest owners, whether of private, communal, or county forests, are eligible for membership. The public or national forests cannot properly be included. The solid support received and the development of the fire suppression organization have resulted in a widespread and effective insurance at a low cost.

The forest fire insurance company pays compensation for damage to the forest floor and to young stands which are not yet merchantable. Stands under a certain diameter limit should preferably be insured for full value. The value of the larger trees is not seriously affected by fire in Norway. The trees may be killed but the trunk is seldom destroyed and may still be utilized as timber at about full price. The financial loss is therefore not sufficiently great to justify the cost of administering insurance on this type of growth.

It is quite different when only the smaller trees and strictly young growth are considered. All of these may be destroyed and the indemnity will then be the same as the insurance, provided insurance is carried for the full value of the stand. But in the latter case the owner assumes his own risk regarding that part of the forest which is above the diameter limit decided on (8 inches or 6 inches at breast height).

The fire-killed timber of larger dimensions can be disposed of at almost the same price as the live timber, provided the timber is cut soon. "Blueing" and insect attack may then be avoided. Insurance is particularly needed for the portion of the stand (e.g. under 8 inches) which will yield the largest production in the future. Here, the insurance accomplishes the greatest benefit and is therefore the cheapest. In case of fire, the soil sometimes receives a setback in productivity or is devastated for a

long time, especially where there is only a thin layer of humus on dry, sharp gravel or sand, on mountain slopes, or hard morainic material. Deeper soil of good quality and loose texture is not impoverished after fire.

The insurance value of the stand depends on the maximum size of trees that are to be insured, rate of growth, and composition of the stand. If it is mostly young growth of readily marketable species and growing rapidly, the value will be high. If it has been decided to what diameter limit one is to insure, the value is set as if the larger trees did not exist. The amount of insurance is left for the owner to decide.

In making out the application, the owner supplies the requested information in as detailed a manner as possible. His estimate of the average value per acre of the different divisions of the forest is accepted. Obviously a more exact description will be furnished if the forest is tallied by diameter classes and conditions in the different parts of the stand are accurately reported. Many forest owners are now giving actual measurements on which they base their appraisals of their forest properties, so that satisfactory information is available. Net productive forest area is calculated by deducting unproductive areas (moor, alpine areas, and water) from the actual or estimated total area and the average value per acre of insurable forest is determined. After a fire, the adjustment is arranged by an appraiser from the company. If the respective parties cannot agree beforehand on this arrangement, a field survey must be made by outsiders experienced in forest matters.

As a rule it is not difficult to decide how the stand appeared before the fire. The larger trees are only scorched and dried and as to smaller trees, even the stems of young seedlings can be seen without difficulty after a fire. If the fire area has not been large, the surrounding undamaged forest affords a basis for the loss calculations. The value of tract in which the fire occurred is appraised as it is found to have been before the fire. The value of the burned trees after the fire is also appraised. The difference between these two values —before and after the fire—is the extent of the damage.

The compensation for damages is figured as follows:

$C = D \times \frac{I}{V}$ where C is the compensation, D is the amount of damage, I is the amount of insurance and V is the value of the forest before the fire. If I is the same as V, the compensation C will then also be the same as D.

Example:

$$\left.\begin{array}{l} D = \$50 \text{ per acre} \\ I = \$70 \quad '' \quad '' \\ V = \$80 \quad '' \quad '' \end{array}\right\} C = 50 \times \frac{70}{80} = \$43.75 \text{ per acre}$$

As the amount of insurance for a forest or wooded estate is, as a rule, based on the average value per acre, it may happen that where only part of an insured area is burned, the reimbursement will be either larger or smaller than the average value per acre of the whole area. If the best part of a tract is burned, it may be larger. If a less valuable part of the forest is burned, the compensation will be less than the average value per acre. If the amount of insurance is correct, the owner receives compensation in all cases for the damage which has occurred, but no more.

In the beginning the premium was 1.25 per mille of insured value per year ($1.25 per $1,000). After 4 years of insurance of any property the premium was reduced to 1 per 1000; after 8 years to 0.60 per 1000 and after 19 years to 0.50 per 1000. After 22 years of insurance, there was no premium at all. Experience indicated that in the 22 years of insurance, during which premiums were paid, reserve funds were built up sufficient to provide for the payment of compensation for damages from interest alone. For forests exposed to unusual fire hazard, the premium was somewhat higher. At present the annual premium is 2.1 per mille for 10 years or 1.1 per mille for 22 years.

When the association began its functions in 1912 it was realized that forest fire protection was the first and foremost prerequisite of forest fire insurance. Forest fire laws were enacted, and a modern system of fire detection and suppression was established. The association has built, in the southeast part of the country, a great many lookout stations (about 60) provided with maps, range-finders, telephones, etc. A system of communication was organized, the telephone service functioning even on Sundays during the dry season.

The progress of the company is evident from the following summary: Starting in 1912 with no capital, the company now has a fund of $1,300,000. The total amount of insurance in force is now (1950) $104,500,000. Of the private forest value in Norway, 80 percent is now insured. A new form of insurance was started in 1924, known as "perpetual insurance" whereby forest owners, by paying a premium once and for all, will have their forests insured in perpetuity. The premium is now 18.3 per mille ($18.30 per $1,000 insured value). The company itself or the Land Credit Association makes loans up to and including six-tenths of the appraised value of insured forests. It is to be noted that the owners of large forest plantations (on the west coast of the country) are specially interested in forest fire insurance, as they can in all cases be reimbursed for economic loss in case of fire.

As a whole, it can be seen that the association has been very successful and is organized on such a broad economic basis that its function in the future is fully assured.

One Page of Graphic Trigonometry

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Upon occasion it is necessary to do work which requires the use of the principles of trigonometry.

A system and a graph are presented here with the idea that they may be of aid in three types of endeavor. First, for those who are presenting the theories to persons who are *using* them for the first time. Second, for those whose memory of the subject has become dim through lack of use. Third, as a condensed form of table for the field note book when a greater degree of refinement may not be necessary. Similar methods have been taught in civil engineering schools in connection with stadia measurements.

The examples which follow are samples of what may be demonstrated on the graph. These problems show how a great deal of information may be put on one page of a notebook. It is done in such a manner that no moving parts are required except a person's eyes and possibly some pointer such as the end of a pencil. It is designed as a method for *comparatively* rough field procedure under adverse conditions. It is *not* designed to take the place of adjuncts of the office such as slide rules, numerical tables, and various calculating machines and methods.

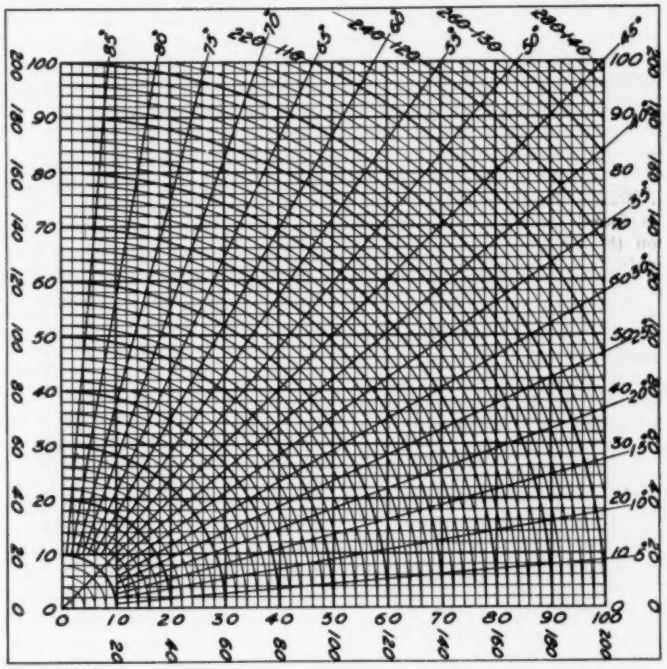


Fig. 1.—Graph to aid in trigonometric problems. In practice the graph is slightly larger and lines are drawn for every degree.

Examples

Slope Measurement and Vertical Distance

Problem.—Slope measurement of 160 feet at vertical angle of -30°. *Answer.*—Enter base at 160-foot point and follow 160 foot circular line to intersection with 30° diagonal line. Looking straight down; the horizontal distance is found to be 138.5 feet. Looking right or left; the vertical distance is found to be 80 feet.

Problem.—To find a horizontal distance of 60 feet on a -30° slope. Enter base at 60-foot point and proceed up the vertical line to the intersection with the 30° diagonal line. The circular lines show a slope distance of 69.3 feet and a vertical distance of 34.5 feet.

Note: Feet have been used as the unit of measure but any unit may be employed—links or inches may be used just as well. If other units are used, the vertical distance is in the same unit of measure unless the lines on that axis are changed. (Cosec. of 30° = 1.1547 x 60 = 69.282 ft. by tables).

Latitude & Departure

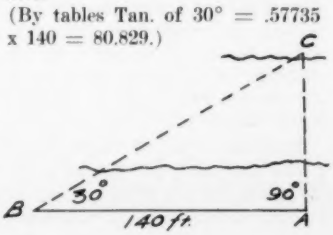
Problem.—Course N30°E; Horizontal Distance 140 feet. *Answer.*—Enter base at 140 feet and follow circular line to intersection with 30° diagonal line. The Northing is 121.2 feet; the Easting is 70 feet.

Problem.—Course N60°E; Horidontal Distance 140 feet. *Answer.*—90° — 60° = 30°. Therefore the figures above are the same but reversed. Northing is 70 feet and Easting is 121 feet. (Tables give Northing of 70 feet and Easting of 121.244 feet).

Right Triangles

Problem.—To find distance to inaccessible point. *Answer.*—At *A* sight on *C*. Measure 140 feet at right angles to *AC* and establish *B*. Obtain angle *A B C* (30°). At 140-unit point on graph on graph go vertically until diagonal line marked 30° is intercepted. Intersection is at 81-unit point vertically above 140 feet, so *A C* = 81 feet.

(By tables Tan. of 30° = .57735 x 140 = 80.829.)



Problem.—To find percent (Simple division also tangent of angle). For example, 40 is what percent of 57? *Answer.*—Enter base at 57 and go vertically to horizontal line from the 40 point. This point is on the 35° diagonal line. Follow this diagonal line until it intersects the line from the 100-unit point on the base. The intersection is at 70 so the percent is seventy. (Forty divided by 57 = 0.70175. By tables Tan. 35° = .70021.) The tangent of an angle is found by reading intersection on the 100-unit vertical line and pointing off two places or by reading intersection on the 10-unit line and pointing off one place. [Tan. of 80° by graph is 5.7 and by tables 5.67128.] The conversion from degrees to percent is done directly by inspection along the line from the 100-unit point.

Problem.—Multiplication. *Answer.*—It is merely the reverse of division. For example, what is 7.5 times 6.2? Enter base at 100-unit point and proceed vertically to 75-unit line coming from the vertical axis. This point is on the 37° diagonal line. Follow this 37° line until it intersects the 62-unit line up from the base. The intersection is at 46.5 line from the vertical axis on the left (7.5 x 6.2 = 46.5).

Problem.—Combining multiplication and division—to solve $\frac{33.25}{138.50} = \frac{x}{360}$. *Answer.*—Enter base at 138.5 and proceed vertically to intersection with 32.25 line from vertical axis. This is just above the 13° diagonal line. Follow along just above this line to the intersection with the vertical line from the 36-unit point on base. This is just below the 8.5 unit line. This is called 83 to 85 depending upon how the eye sees it—say 84. [Actually 32.25 divided by 138.5 equals .23 or .232852. Multiplying 360 times .23 equals 82.8 and by .232852 equals 83.82672.]

Problem.—Sine of Angle (Opposite side over the hypotenuse). To obtain the sine of 35°. *Answer.*—The divisor is the hypotenuse. For ease in computation it is kept at 100 units whenever possible. Enter the base at 100-unit point and follow the circular line from this point to the diagonal line 35°. This intersection is between the 57 and 58 lines from the vertical axis. So, with the hypotenuse being 100, we point off two places and get .574. (The sine of 35° by tables is .5736.)

Problem.—Cosine of angle (Adjacent side over the hypotenuse), To obtain the cosine of 35°. *Answer.*—The procedure is practically the same as above except that the figure is read on the base and is .8200. (By the tables cosine of 35° = .81915.)

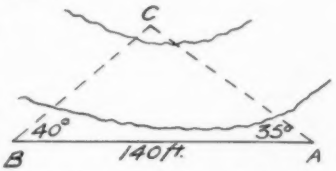
Problem.—Cotangent (Adjacent side over side opposite). To obtain the cotangent of 20°. *Answer.*—The divisor is the opposite side. For ease in computation it is kept at 10 or 100 whenever possible. the cotangent of an angle is equal to tangent of 90° minus the angle (90° − 20° = 70°). So, follow the diagonal marked 70° to the point where it crosses the line coming up from the 10 unit point on the base. The intersection is between the 27 and 28 unit lines on the vertical axis, or 27.5. Since the divisor is 10, point off one place and the cotangent of 20° = 2.75. (From the tables the cotangent of 20° is 2.7475.)

Problem.—Secant (Hypotenuse over adjacent side). To find the secant of 55°. *Answer.*—The divisor is the adjacent side. For ease in computation it is kept at 10 or 100. Enter graph at 100-unit point on the base and proceed vertically to point of intersection with the 55° line. This intersection is beyond the circular line from the 174 unit point but not to the 175 unit circle, so call it 174.5. The base is 100, so point off two places and have 1.745. (By the tables secant of 55° = 1.74345.)

Problem.—Cosecant (Hypotenuse over opposite side). To find the cosecant of 65°. *Answer.*—The divisor is the opposite side so whenever possible it is kept at 100 or 10. Follow the 65° diagonal line until it intersects the line from the 100-unit line on the vertical scale. The intersection is just beyond where the circular line comes from the 110-unit point but not quite half way to the 111-unit circular line (say 110.4). The triangle has been constructed with opposite side equal to 100 units so point off two places and have cosecant of 65° = 1.104. (According to the tables cosecant of 65° = 1.10338.)

Oblique Triangles

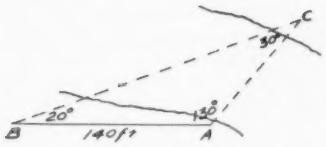
A. Two angles and the included side.



Problem.—Location of inaccessible point. *Answer.*—Angle $B\ A\ C = 35°$; $AB = 140$ ft.; Angle $A\ B\ C = 40°$. Enter base of graph at 140 feet and follow circular line to diagonal line marked 35° (point A). Thus a base of 140 ft. is obtained and the angle $B\ A\ C$ (35°) is formed by the horizontal line at the point of intersection. An angle of 40° is needed at point B (B is now the same as 00 on the graph). Since 40° + 35° = 75°, follow up the 75° diagonal line from 00 until it intersects the horizontal line through A (140 feet circle and 35° diagonal). This is point C and we have constructed a triangle on the graph that is same as that given in the problem.[1] Point C is at the point on the 75° line where the circular line comes from the 83-unit point on the base. Thus the line BC is 83 feet long. Point A is directly above the 114.5-foot point on the base and point C is directly above the 21.5-foot point on the base so line $A\ C = 114.5 - 21.5 = 93$ feet.

$AB = 140$ feet; Angle $A\ B\ C = 20°$; Angle $B\ AC = 130°$. Let 00 on the graph equal point B in the triangle. Point C will be somewhere along the diagonal marked

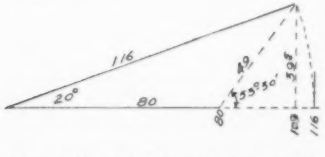
[1]The triangles are not actually drawn on the graphs. In practice the pencil or merely the eye picks out the points and values are read and recorded.



30° and point *A* will be along the diagonal 30 plus 20 or 50° and on the circular line from the 140-unit point. Point *C* is found by following the horizontal line which passes through the intersection of the 50° diagonal and 140-unit circle to the intersection of this horizontal line with the 30° diagonal line. This is found to be on the 215-foot circular line and directly above the 186-foot point on the base. So *BC* is 215 ft. Point *A* is directly above the 90-unit point on the base and *C* is directly above the 186-foot point on the base so line *AC* is 186 − 90 = 96 feet. Thus the triangle is constructed on the graph and values read off.

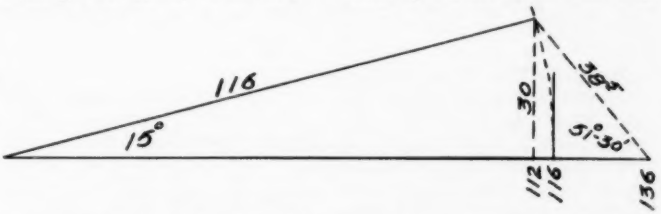
Triangle	*Graph*
B	00—lower left hand corner
A	Intersection 140-unit circle and 50° diagonal line
C	30° diagonal line and horizontal line from point A (140-unit circle and 50° diagonal).

There are other solutions of this problem by using the graph, but this appears to be the most simple. Note: If *AB* was beyond range of graph, say 700 feet., then the triangle would be computed on graph with *AB* = 100 feet and the results would be multiplied by 7 to get answers.



Two sides and the included angle.

Problem.—Reporting wind velocity and direction from patrol plane. *Answer.*—By flying over a known course and distance the following data are obtained: True air speed 116 mph.; True course 70°; True heading 50°, Ground speed 80 mph.; Question is wind velocity and direction. Enter graph on base at 116-unit point and follow circular line to 20° diagonal line. This intersection is at 39.5 on vertical scale and above 109 on base. Ground speed is 80 mph. so we wish to know the hypotenuse of triangle formed by 80-unit point on base, 109 unit point on base, and intersection of 116 circular unit line with 20° diagonal line. The base of the triangle is 109 minus 80, or 29, and the altitude of triangle is 39.5. Enter base at 29-unit point and proceed vertically to 39.5-unit point. This intersection is on 49 circular unit line and 53° 30′ diagonal line. So wind velocity is 49 mph. and true bearing is 70°-53°-30′ = 16° 30′.



Data obtained as before gives following: True air speed 116 mph., true course 250°, ground speed 136 mph., true heading 235. Question wind velocity and direction. Enter base at 116-unit point and follow circular line to 15° diagonal line (250°-235° = 15°). This intersection is opposite the 30-unit point on the vertical scale and above the 112-unit point on base. The ground speed is 136 mph. so we wish to solve the right triangle that has a base of 24 (136-112) and an altitude of 30. Enter base at 24 and proceed vertically to 30-unit point on vertical scale. This intersection is on 51° 30′ diagonal line and the 38.5 circular line. Thus the velocity of the wind is 38.5 mph. and from (70 + 51° 30′) Or 250° − (180°-51° 30′) or 121°-30′.

Parallelograms of Force

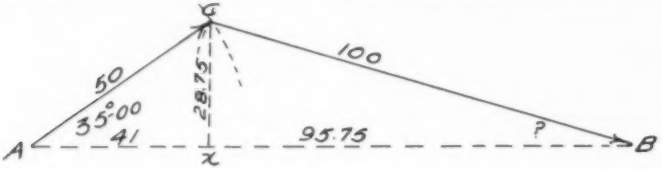
Problem.—A force of 150 units acted upon by a force of 40 units at angle of 60°:—a. Acting from same quadrant. *Answer.*—Consider that the point of contact of the two forces is at point 00 on graph. Enter graph on base at the 40-unit point and follow circular line from this point to intersection with the 60° diagonal line. This intersection is found to be directly above the 20-unit point on the base and opposite the 34.7-unit point on the vertical axis. What is needed is a parallelogram. The other force is 150 units and the component which must be added is 20, so enter base at 170 and proceed vertically to 34.7-unit line. This last point completes the figure and is found to be on the circular line from the 173-5-unit point and on the diagonal of 11.5°. Thus the component of the two forces is 173.5 units acting at angle of 11° 30′ from the line of force represented by the 150 units. The units may be pounds, tons, miles per hour etc., etc.

Problem.—Acting from an opposing quadrant; use the same quantities as above. *Answer.*—The resolution of the force of 40 units acting at an angle of 60° is the same. However, instead of adding the 20 units to the 150 they are subtracted and result is 130. Enter base of graph at 130-unit point and proceed vertically to 34.7 unit line. This intersection is on the 134.5-unit circle and the 15° diagonal. Thus the resultant of this parallelogram is 134.5 units acting at an angle of 15° from the original direction given for the 150-unit force. The units may be tons; pounds; miles per hour, etc.

Triangles of Force

Given.—Power of two sides and angle betwen a known force and the unknown force. Force of 50 making an angle of 35° with an unknown force. These two forces are to be brought into equilibrium by a force of 100. *AC* = 50; *CB* = 100; angle *CAB* = 35°. To solve for *AB* and angle *ABC* enter graph at base on 50-unit point and

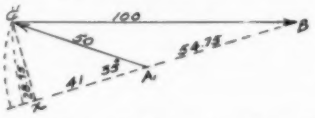
follow circular line to intersection with 35° diagonal line. Reading to the left on the vertical scale the value is 28.75 and on the horizontal scale at base of graph, 41. Thus $Ax = 41$ and $Cx = 28.75$. Enter graph on base at 100 and follow circular line to 28.75 on the vertical scale. Angle is 16° 45′ and reading vertically down the value is 95.75. Thus $XB = 95.75$ and angle $ABC = 16° 45'$.
$AB = Ax + xB = 41 \times 95.75 = 136.75$.



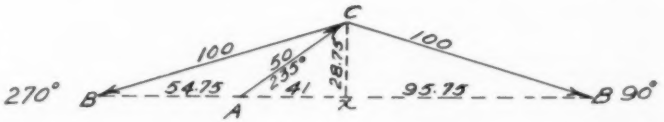
Problem.—If the wind is 50 mph. from 235° the plane flies at 100 mph. What heading must the plane fly to reach a point directly east (90°) and what should be the distance covered over the ground in one hour. *Answer.*—True Heading 106° 45′; Ground Speed 136.75 mph.

Problem.—With wind at 50 mph. from 125°, and speed of plane 100 mph., what true heading must be flown in order to make good a course over ground of 90°. *Answer.*—Enter graph on base at 50-unit point and follow circular line to intersection with 35° diagonal. Read on vertical scale as in previous example.

$A_1x = 41$, $Cx. = 28.75$, $xB = 95.75$. Angle $ABC = 16° 45'$.
$A_1B = xB - xA_1 = 95.75 - 41 = 54.75$ mph.
Ground speed = 54.75 mph. True Heading = 106°-45′.



Problem.—Radius of action of fire patrol plane (combine two foregoing problems). *Given.*—Wind 50mph. from 235°; air speed 100 mph. *Desired:*—Radius of action on 90° out and 270° return. *Answer.*—50 at (270-235) 35° = 41E and 28.75 N., at 28.75 N = 95.75 Easting and angle of 16°-45′. Thus ground speed out = 95.75 E + 41E = 136.75 mph. Ground speed back = 95.75 W − 41E = 54.75 mph. Enter base of graph at 54.75 and proceed vertically to 136.75 (136.75 divided by 54.75) and find intersection just above the 68° diagonal line. Follow just above the 68° diagonal to intersection with 10 line and point off one place thus 2.5. Thus 1 hour east requires 2.5 hours to return. A total of 3.5 (1 + 2.5) hours flying time per hour flown east. Number of hours gas supply divided by 3.5 gives number of hours which can be flown out before having to turn back. Use 5 hours supply (*not* including reserve). Enter graph at base on 3.5 and proceed vertically to 5 (5 ÷ 3.5). The intersection is on the 55° diagonal, so follow this to the intersection with line from 100-unit point on base and find intersection at 1.43 hours. This is the number of hours that may be flown out and still get back if wind holds. Now continue to look along the 55° diagonal line until the line from 136.75-(mph. out) point is crossed. This intersection is on line from the 196-point on vertical scale (1.43 × 136.75 = 195.6) = 196 miles, the distance which can be flown out and back with conditions as given (i.e. radius of action).
True Heading for 90° course = 90° + 16°-45′ = 106°-45′
True Heading for 270° course = 270 − 16°-45′ = 253°-15′



Federal-State Cooperation in Forestry Work

President Charles F. Evans, Society of American Foresters, presented an analysis of philosophy and administration of federal-state cooperative programs administered by the U. S. Forest Service as a guest lecturer at the Duke University School of Forestry in 1950. The lecture appears in printed form as Number 9 of a series of guest lectures given at the school since 1941. Copies are available from the school at Durham, North Carolina.

Should Small Woodlots be Managed for Sustained Annual Yield?

H. H. Chapman
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A WIDELY ADVOCATED theory in public relations is that the way to get the owner of a small tract of woodlands interested in forestry is to show him how he can obtain an annual return from his timber instead of cutting it all at one time and then having no income for a long future period. This economic goal once set, the whole pattern of silviculture and management is then more or less violently bent and twisted into a shape that may have no sound relation to the ecology of the species dealt with nor to the actual economic needs and desires of the owner who is to be educated and benefited.

If this is the wrong approach, it is a serious matter for forestry. As is well known, over 4 million owners hold forests averaging but 62 acres per unit and it is this area, comprising 76 percent of all private forest lands, on which most of the destructive brand of cutting is still being practiced. With the federal government, through the Forest Service, the Soil Conservation Service, the Extension Service, and in other ways, giving more and more attention to sound silvicultural and economic practices on the small holdings of these same 4 million owners, the possibility that these federal services and some state foresters may be off on the wrong foot is a cause for uneasiness.

Since the advocacy of annual or very frequent "sustained yield" cutting on these small areas originated from and is based purely on the economic theory that the owner prefers or is even dependent on annual income from timber and cannot afford to practice sound forestry if he has to wait long periods for his results, this assumption constitutes the foundation for the whole superstructure both economic and silvicultural. If defective the building may fall.

Is this postulate sound? Except for an annual drain for home firewood, and posts for fence repairs, the custom is practically universal among this class of owners to cut all the merchantable timber present in one operation, repeating the process if and when the stands recover and again produce a volume sufficient to attract a buyer. Since these owners, in common with all other operators before the advent of good forestry practice, paid little attention, for the most part, to immature trees and none to reproduction, their woodlands suffered the same degree of devastation or deterioration that occurred on the larger areas, except for better fire protection and the ability of hardwoods to sprout, and the seeding up of old fields to pine.

The efforts to correct these abuses and start the owner on the right track naturally followed the line of preserving young immature trees in stands of mixed and all-aged character. Marking to improve the stand by removal of overmature and defective trees found its logical place. Repeated cuts at 20- to 30-year intervals were then possible for types and species like the tolerant northern hardwoods, beech, birch, and maple. In fact, some of the better informed owners in northern New England had been practicing such forestry in this type for generations. But when and if this periodic cutting practice is shifted to an annual basis, and is advocated indiscriminately for practically all types and regions, there is danger that that process will violate both the silvicultural requirements of the type itself, on the one hand, and the economic needs of the owner on the other, and thus fall between two stools.

Let us deal first with the economic motive for advocating annual income from the woodlot. The fallacy, if there be one, for requiring annual returns consists in confusing the position of the owner of such a small tract with that of the company or agency which possesses an area large enough to constitute a business of its own—in which case sustained annual income must perforce be the goal of management. Small owners on the other hand fall into two general classes, farmers and all others. The farmer already has and is operating a going concern, the farm, and except for the aforementioned source of fuel and minor products is not dependent on annual net revenue from his woodlands for his livelihood. Other classes of owners of small woodland areas are either residential and supported by other business activities, or speculative. In either case, they may not want to be bothered with constant annual frittering with a few logs or cords of pulpwood. The real economic attitude of each of these classes of owners is practically identical. What is it?

It is what it has always been. Operations in a small woodland for the logging of merchantable products should be concentrated at one time, with the removal of practically all the mature timber in a single sale or logging job. The only difference between past and continuing present practice for these owners, and sound forestry management, consists in the substitution of good silviculture for ruthless exploitation. Neither good silviculture nor sound economics indicate the abandonment of heavy periodic cuts and the adoption of annual whittling out of a few logs or cords.

From the economic standpoint there are two principal sets of reasons for favoring heavy cutting of small tracts, at widely separated periods, as against too frequent, or annual, cutting. These are:

1. The margin for stumpage values in sales of timber increases *per unit* of volume sold, directly as the total volume and average stand per acre increases, for the reason that costs of operation are thereby reduced. Unless logging is done by the owner as a measure for employing labor in slack seasons, this factor is of determining importance provided he obtains fair value in the sale.

2. The owner regards his woodlot in the nature of a reserve or in-

vestment rather than a drawing account. In nearly every instance, sales, whether made under forestry practices or not, serve the purpose of securing funds to meet emergencies. These are:

a. For construction or replacement of farm buildings.

b. For putting children through college.

c. For sickness.

d. In case of settling estates.

e. As the basis of bank loans to be liquidated by sale if necessary.

When all is said and done, economic factors determine what any class of private or of public owners can and will do with their forest lands. The well meaning efforts so widely and extensively put forth by public agencies to induce owners to abandon heavy and long periodic cutting in favor of "annual revenue from the woodlands," sometimes emphasized by demonstration forties on which only an amount equal to the annual growth is cut each year, are all to the good when justified by sound economics, but not when the practice runs counter to the best interests of the owner, which I am convinced is usually the case for the reasons cited.

If waiting for returns is as serious an obstacle as it is held to be to justify "annual" cutting practice, there would be practically no planting of conifers by small owners. Yet it is often easier to persuade these owners to plant trees than to manage existing woodlands on sound silvicutural principles. The rapidly expanding demand for nursery stock is an indication of this fact.

Actually, in regions of rapid growth, and an active competition for pulpwood, creosoted posts, and other small products, the period of waiting for returns from reproduced or planted stands is not a serious factor. Thinnings for pulpwood can start in as early as 10 years in slash pine and 18 to 20 years for other southern pines grown in even-aged fully stocked stands. By dividing a woodlot into even as little as two age classes, each large enough to permit of an economical final cut of sawlogs and intermediate thinnings, the waiting periods are cut in half.

If basic economics indicate a preference for intermittent rather than annual yields from small tracts, the attempt to distort fundamental silvicultural requirements of given species to fit the pattern of annual whittling is nothing short of suicide when such practices run counter to the demands of the forest type and silvicultural systems that are indispensable if reproduction and perpetuation of the desired species is to be secured.

Such is the case with practically all the southern pines, and to a considerable extent in other regions and forest types. Standard practice as defined and accepted by the U. S. Forest Service for longleaf pine and as advocated for loblolly pine (*Report of Chief of the Forest Service 1949*, Page 5, 4th paragraph) requires the use of prescribed fire or the scarification of the soil and the removal of competing hardwood growth by these means, as the method for securing adequate reproduction of pine instead of inferior hardwoods. But this means the advocacy of even-aged stands, or groups, growing in full light. By contrast, the advocates of annual cutting place emphasis on the removal of individual trees and the practice of the "selection" system of silviculture, the net result of which is the taking over of the woodlot by comparatively worthless and undesired hardwood sprout growth, the prevention of the use of prescribed fire as a silvicultural tool, and the ultimate ruin of the tract as far as profit is concerned.

Sound economics and sound silviculture, at least for southern pines, are in harmonious agreement. Both point to the necessity for the growing of even-aged stands, in areas and volumes large enough to form the basis of profitable logging operations, while affording the maximum possibility of full stocking of pine instead of less desirable hardwoods on natural pine soils.

In conclusion, the writer has noted that European authorities recognize the fact that sustained annual yield is not and cannot be the goal for owners of small woodland areas. Sir William Schlich in his fifth edition of the famous *Manual of Forestry*, 1925 states: "Distinction must be made between (1) The intermittent working, if successive final returns are separated by a varying number of intermediate years; (2) The annual working, if final cuttings occur each year. The regulation of the yield of forests worked intermittently is very simple. It is only necessary to ascertain the most suitable rotation, taking into consideration the objects of management, and to make the intermediate cuttings whenever they are necessary. *The matter becomes more difficult when an equal annual yield is expected* (italics supplied). The method of annual working is not an absolute necessity. Each of the two methods of working possesses peculiar advantages, and the choice depends on local conditions."

American forestry practice as applied to the 4 million small owners may still have something to learn even from "old Bill Schlich"!

Hybrids Between Ponderosa and Apache Pine

F. I. Righter and J. W. Duffield
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PONDEROSA PINE (*Pinus ponderosa* Laws.) is a species which, because of its wide distribution and great commercial importance, has occupied an important place in the pine breeding program of the Institute of Forest Genetics, at Placerville, Calif. On the western slope of the Sierra Nevada, where this pine attains its best development, it displays capacities for rapid growth and high quality that augur great difficulty for the tree breeder who would improve it in those respects. Nevertheless, definite and conspicuous improvement in form and size of seedlings and in rate of early plantation growth apparently has been effected by crossing it with the Apache pine (*Pinus latifolia* Sarg.) of southwestern United States and northwestern Mexico. Evidence from several nursery and plantation experiments indicate that the hybrid merits extensive testing in California and throughout the pine regions of the southwest. The purpose of this article is to record its development through the first 6 years of its growth. Detailed taxonomic description must await production of cones—an event which may not occur for several years.

Since *Pinus latifolia* is a little-known species, it is appropriate to touch on its characteristics, distribution, nomenclature, and the similarities and differences between it and various other pines. An early account (*3*) of it notes four respects in which it strikingly resembles longleaf pine (*P. palustris* Mill.): its leaves are from 8 to 15 inches long, its seedling quickly sends down a large and long taproot; early height growth is slow; the young seedlings have relatively few branches. By these features alone *P. latifolia* is readily distinguished from *P. ponderosa*, with which it grows and with which it has been considered synonymous (*11*). Natural crossing between these species has not been reported.

Other important features of *P. latifolia* are its rapid growth rate between the ages of 8 and 75 years and its comparatively short life—from 175 to 200 years (*12*). According to Lemmon (*4*) it reaches a height of 80 to 120 feet and a diameter of 3 to 5 feet. Sudworth (*12*) records mature trees from 50 to 75 feet high and from 14 to 30 inches in diameter. It occurs at altitudes from 5,500 to 8,200 feet.

Further field and experimental studies must be made before the confusion regarding nomenclature and relationships of this species can be dispelled. Nevertheless, in giving its distribution, it is helpful to refer to the work of Martinez (*6*). His discussion of *P. macrophylla* Engelm., which is based on comprehensive field and herbarium studies, clearly refers to the entity here termed *P. latifolia*. According to Martinez, *P. macrophylla* occurs in Sonora, Chihuahua, Sinaloa, Zacatecas, and Durango, and its variety *Blancoi* is found in Coahuila as well. In the United States *P. latifolia* occurs only in Arizona and New Mexico, chiefly in the Chiricahua and Santa Rita Mountains.

Lemmon (*4*), usually less prosaic than most of his colleagues, states that it "clothes the Apache-infested mountains of southern Arizona." Legend has it that he botanized there while the Apaches were on the war path. Perhaps this partly accounts for the fact that he described a new species, *P. Apacheca*. This name has now been reduced to a synonym, while the common name remains Apache pine; Arizona longleaf pine has been dropped because of its geographic inadequacy (*12*).

The relationships between *P. latifolia* and several other pines are an appropriate and interesting subject of inquiry. Morphological similarities between *P. latifolia* and *P. ponderosa* led several botanists to suspect that they are closely related. The fact reported herein that they hybridize readily gives support to that opinion. Martinez (*6*) suggests that *P. latifolia* is related to *P. montezumae* also. The fact that the latter also has a seedling which closely resembles the grass-stage seedling of *P. palustris* would add support to that hypothesis. Additional support for it might be found in the fact *P. montezumae* and *P. ponderosa* have been crossed at the Institute of Forest Genetics (*10*). The similarities between *P. latifolia* and *P. palustris* have already been discussed.

Shaw's (*11*) group *Australes* includes *P. ponderosa* and its southwestern relatives as well as the yellow pines of the southeastern United States (*P. caribaea, P. echinata, P. glabra, P. palustris* and *P. taeda*). Despite repeated efforts to cross *P. ponderosa* with these southeastern Australes, no hybrids have so far resulted (*10*). There remains the possibility that the yellow pines of the southwestern United States and northern Mexico may provide a means of combining the heredities of *P. ponderosa* and our southeastern yellow pines.

Experimental Procedure

Pollinations, according to the procedures described by Cumming and Righter (*1*) were first made in 1943. Nursery tests, started in 1945, and plantation tests, first established at the Institute of Forest Genetics in 1947, followed the procedures outlined by Liddicoet and Kimbrough (*5*). Seedlings of *P. latifolia* were not grown in the nursery tests until 1949 because of lack of seed. All measurements reported herein were made during the dormant season.

Field tests of the hybrid also are being started. In the spring of 1950, planting crews of the Sierra National Forest interplanted (*9*) about 200 of the *P. ponderosa* x *latifolia* hybrids as 2-0 stock with 2-0 stock of *P. ponderosa* raised from seed collected by the California Region, U. S. Forest

Service. Hybrid and non-hybrid stocks were raised at the Mount Shasta Nursery by similar, routine procedures.

Results

Since the first pollinations were made in 1943, a total of 22 trees of *P. ponderosa* have been used as seed parents for the cross. Pollen of *P. latifolia* has been used from several trees in the Eddy Arboretum and from trees growing in southeastern Arizona. In general, all crossings between these species produced seedlings which followed the same pattern of growth. Therefore, the development of one lot of hybrids will be presented as typical of all of the 16 lots tested at the Institute of Forest Genetics from 1945 through 1950.

As a rule, the yield of sound seed per cone following controlled pollination of *P. ponderosa* with pollen of *P. latifolia* has been appreciably lower than yield following "wind" or uncontrolled pollinations (presumably with *P. ponderosa* as pollen parent) on the same seed trees. Considering a series of ten seed trees pollinated over several seasons, sound hybrid seeds per cone have ranged from 1.3 to 45.2. On the same trees sound non-hybrid seeds per cone have ranged from 7 to 85. Although the data in hand are inadequate for a critical anlysis of hybrid seed production by individual trees, they suggest strongly that certain seed trees are much more productive of hybrid seed than others. For example, one seed tree, in two different years produced the minimum yield of 1.3 sound hybrid seeds per cone, while in the same years it gave average yields of non-hybrid seed. This suggests that efficiency of production of hybrid seed may eventually be increased by better selection of seed trees.

Results of previous investigations (*8*) suggest that interspecific hybrids in *Pinus* may differ from non-hybrids from the same seed trees in time required for germination of seed. Such differences were observed in these experiments. In the 1945 nursery, non-hybrid seeds from one tree germinated in 15.4 days and hybrid (*P. ponderosa* x *latifolia*) seeds required 15.8 days. This small difference is just below significance at the 5 percent level; however, the non-hybrid and hybrid progeny from another tree, in the same nursery, required 15.7 and 17.1 days respectively—a highly significant difference. In 1948, in a small test, non-hybrids and hybrids required 16.2 and 18.4 days, respectively, although the difference was not significant at the 5 percent level. Thus, at Placerville this hybrid germinated somewhat less promptly than non-hybrids from the same seed trees.

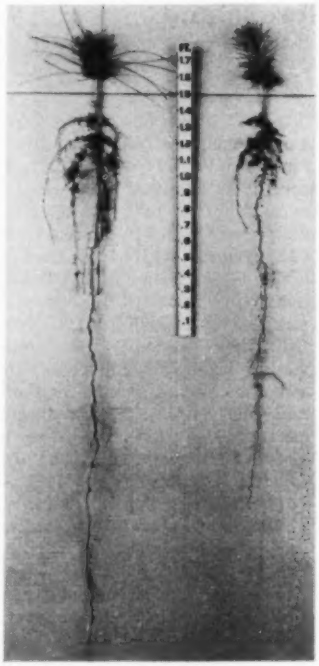

FIG. 1.—Year-old seedlings. On left, *P. ponderosa* x *latifolia*; on right *P. ponderosa* from same seed tree and adjacent nursery row. Note differences in foliage and extent of root systems.

Under conditions maintained in tests at Placerville, some species of *Pinus* consistently produce needle fascicles during the first year of growth; others do not. The parents of the hybrid under discussion are distinct in that respect: *P. ponderosa* normally produces fascicles during the second year of growth and *P. latifolia* produces them during the first year. Each species throws some exceptions, but the percentages of exceptions have been low in populations observed at Placerville. Year-old populations of the hybrid consistently contain a higher percentage of seedlings bearing needle fascicles than do non-hybrid populations from the same seed trees. As an example, in the 1945 nursery test the hybrid and non-hybrid populations from one tree had, respectively, 86 and 20 percent of 1-year seedlings with fascicles. In this test, for which seed were sorted by weight classes and adjacent hybrid and non-hybrid plots sown with seed of the same weight, a positive correlation was found between seed weight and percent of fascicled seedlings (each plot taken as a unit) in both populations. As might be expected from previous findings on the relation between seed weight and early seedling growth (*8*), the fascicled seedlings, having originated on the average from heavier seeds, were taller at one year than the non-fascicled. This applied to hybrid and non-hybrid populations. However, the hybrid population, which was 86 percent fascicled, had a mean height at one year of 3.4 inches, whereas the non-hybrid population, only 20 percent of which was fascicled, averaged 4.3 inches—a highly significant difference. In several tests, the primary leaves on the hybrids were consistently longer than those on the non-hybrids.

For more intensive study, small samples of hybrid and non-hybrid 1-0 and 2-0 seedlings were carefully dug from the 1945 test, and determinations were made of dimensions and weights of foliage, stems, and roots. Since the samples were necessarily small, few statistically significant differences were found. However, in this and several similar samplings, the following differences were consistently found. Hybrids had shorter tops, longer and heavier roots, larger stem-caliper at ground level (both inside and outside bark,) thicker bark, heavier foliage, and a much higher water content, particularly in their stems (perhaps a reflection of thicker bark). Figures 1

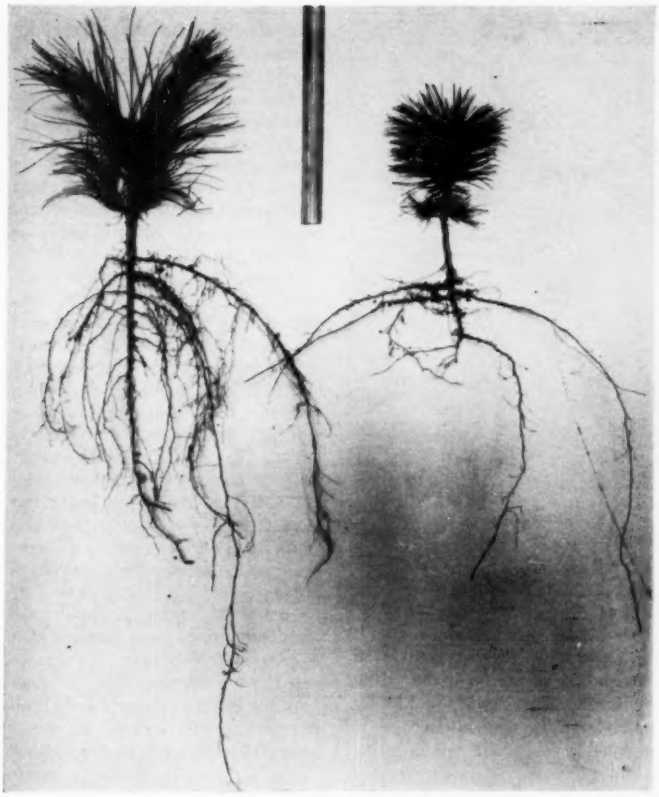

FIG. 2.—Two-year seedlings. On left, *P. ponderosa* x *latifolia;* on right, *P. ponderosa* from same seed tree and adjacent nursery row. Hybrid has longer, more ascending needles, stouter stem and much more strongly developed tap-root. Bottom of foot rule is at ground line.

to 4 illustrate some of these differences for seedlings of 1, 2, and 4 years. *P. latifolia* seedlings from the 1949 and 1950 sowings in the Institute nursery are even shorter, thicker-barked, and have heavier foliage than the hybrids, which thus appear intermediate between the parent species.

The course of height growth of hybrid and non-hybrid progenies is shown in Figure 5, in which height in feet is plotted on a logarithmic scale against age in years. The data for nursery and plantation growth are based on different sub-samples of the same populations, containing 140 trees for the nursery data and 20 trees for the plantation. The vertical bars in the diagram represent fiducial limits with a probability of 5 percent. Thus it is evident that hybrid and non-hybrid samples differ significantly at all ages except at 2 years, at which age their height-growth curves cross.

Diameter growth of hybrids and non-hybrids is also shown in Figure 5. Measurements were made at ground level in the nursery bed. That the greater diameter of the hybrids is not merely basal swelling is evident from Figures 3 and 4, and from Figure 6, which represents sections taken more than a foot above ground level.

During the second year of growth, the hybrids had longer needles than the non-hybrids. The needles on the hybrid pointed upward, those on the non-hybrids were almost horizontal. These features may be seen in Figures 2 and 3. At the start of the third year, just as needle emergence was starting on most of the non-hybrids, both populations were rated for earliness of needle emergence. On this date (April 25, 1947) 94 percent of the hybrids had started needle growth, whereas only 6 percent of the non-hybrids had done so. This difference is highly significant. When needle emergence was well started on all plants, another population difference became evident; the hybrids produced fascicles on the new leader immediately above the developing lateral branches whereas most of the non-hybrids had a bare stem of variable length between the lowest needles and the developing whorl of laterals. This bare length was measured in both populations. In the hybrids it averaged ¼ inch; in the non-hybrids 1¼ inches—a highly significant difference. The length of bare stem in the non-hybrids was clothed with sterile bracts deposited in 1946 (in the terminology of Doak (*2*) these bracts are group A of the sterile series) plus the bud scales which had been laid down as primordia in 1945 (group B of sterile series). In the hybrids, virtually no sterile bracts were deposited in 1946. Therefore, very little of the shoot produced in 1947 was without fascicles. Subsequent years' growth and other tests have shown this difference between ponderosa pine and the hybrid to be constant. It is illustrated in Figure 4.

During 1947 and 1948, observations made by J. M. Miller, of the Bureau of Entomology and Plant Quarantine, indicated that the hybrids were as highly susceptible to killing by the pine reproduction weevil (*7*) as are ponderosa and Jeffrey pine.

Discussion

The early development of the hybrid *P. ponderosa* x *latifolia* shows several features which suggest that this hybrid may have certain advantages over *P. ponderosa* for reforestation in the California pine region. First is the rapid penetration of a long, stout tap-root. In a region of high summer temperature and little or no sum-

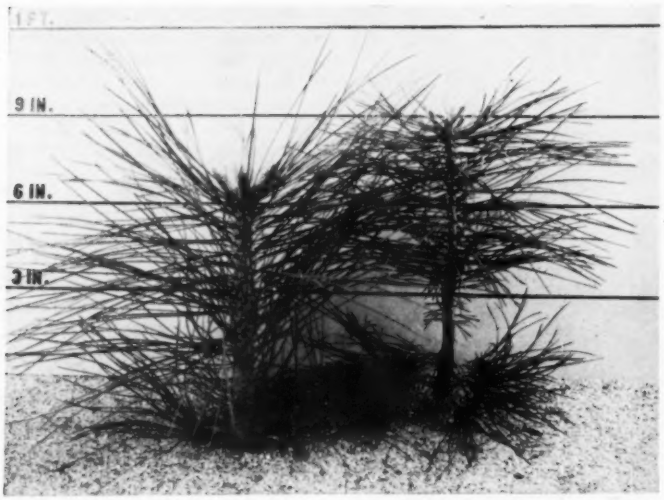

FIG. 3.—Two-year seedlings. On left, *P. ponderosa* x *latifolia*; on right, *P. ponderosa* from same seed tree. Note longer needles and stouter stem of hybrid.

mer rainfall, this characteristic of the hybrid might often mean the difference between failure and success in establishing permanent stands through direct seeding, particularly if practicable means of protecting the seeds are developed.

Much of the planting of ponderosa and Jeffrey pines in California has been accomplished with 2-year-old stock, mostly 1-1. The rapid early root development of the hybrid suggests that it may lend itself more readily than ponderosa and Jeffrey pines to the production of 1-0 planting stock, permitting large reductions in nursery costs.

The early development of the hybrid has other implications for nursery practice. It suggests that it is possible in general, either by species hybridization as in the present instance or by breeding with individuals selected within a species, to develop types with morphological characteristics more nearly conforming to the nurseryman's ideal than is true of the stock currently grown from wild seed. At present, it is common practice to achieve certain morphological goals, such as top-root ratio and stem caliper, by control of environment. This may lead, as Wakeley (*13*) has pointed out, to production of stock of high morphological grade but low physiological grade. The nurseryman who can control the heredity as well as the environment of his stock should have a superior product. It is probably safe to assume that the hybrid seedlings differ from the non-hybrids in physiological as well as morphological grade when grown together. However, it is not safe to assume that the hybrids would necessarily grade higher on a physiological scale. In fact, the evidence presented here that morphological grade has a hereditary as well as an environmental component, would serve to support Wakeley's (*13*) contention that morphological grade may be an unreliable indicator of true grade or survival potential.

Observations on the first quarter-century of growth of *P. latifolia* in the Eddy Arboretum, and the remarks of Sudworth (*12*) lead to the conclusion that this species differs radically from *P. ponderosa* (at least those races of the Sierra Nevada) in the form of its growth curve. The early growth of *P. latifolia* is apparently more rapid, but it levels off in a few years and most trees live no longer than 200 years (*12*). *P. ponderosa* in contrast starts more slowly, but having entered its "grand period of growth" maintains a rapid rate for many years and attains ages in excess of 700 years. We do not yet have sufficient data to compare the hybrid precisely with both parents. Nevertheless, it would seem from general considerations

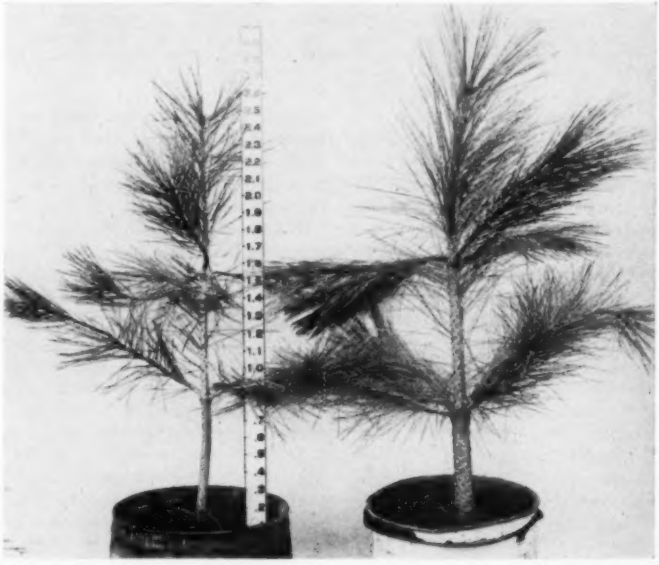

FIG. 4.—Four-year-old plants. On left, *P. ponderosa*; on right, *P. ponderosa* x *latifolia* from the same seed tree and adjacent nursery row.

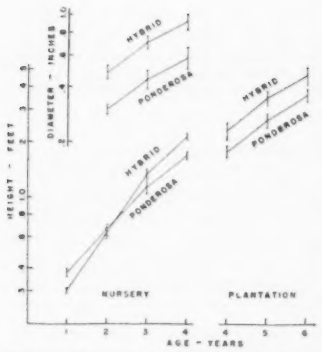

FIG. 5.—*Below, left*: Four years' height growth of hybrids and non-hybrid seedlings in the nursery. *Below, right*: Three years' height growth of hybrid and non-hybrid plants in plantation. *Above*: three years' diameter growth of hybrid and non-hybrid seedlings in the nursery.

that if the early growth of ponderosa pine could be accelerated, even at the cost of hastening the time at which growth begins to decline, the result would be agreeable to the forest manager. The amount of modification of the growth curve which would be desirable would depend on the dimensions at which it would be most economical to harvest the trees. Hybridization between types with different growth curves may offer the means for developing growing stock with growth patterns suited to particular environmental and economic situations. Early growth of the hybrid between *P. ponderosa* and *P. latifolia* suggests that this is practicable.

No doubt, the hybrids already under test and growing in nurseries will eventually give evidence of serious shortcomings. In many cases, it will prove possible to remedy these by back-crossing the hybrid to one or the other parent species or even to a third species or hybrid. In fact, work is already under way at the Institute of Forest Genetics to introduce into the *P. ponderosa* x *latifolia* hybrid the resistance to the pine reproduction weevil possessed by *P. coulteri* (7). This may require several successive hybridizations, and the product may count four species in its pedigree. We know, however, from genetic principles and the experience of agricultural plant breeders that there will be no finished product; tree breeding will be a dynamic, progressive process.

Summary

The first 6 years' growth of an artificially produced hybrid between *P. ponderosa* and *P. latifolia* has been compared with that of the commercially important parent—*P. ponderosa*. The hybrid rapidly develops a long taproot and then proceeds to outgrow *P. ponderosa* both in height and diameter. These features of the hybrid are discussed in relation to planting and forest management in the California pine region.

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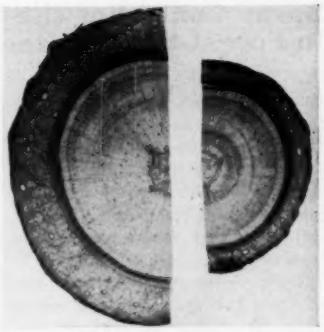

FIG. 6.—Cross-sections of stems of 3-year-old plants of the same height, taken at same level above ground. On left, *P. ponderosa* x *latifolia*; on right *P. ponderosa* from same seed tree.

Spray Control of the Fusiform Rust In Forest-tree Nurseries[1]

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FUSIFORM RUST, *Cronartium fusiforme* (Arth. & Kern) Hedgc. & Hunt, has caused severe losses in southern pine tree nurseries on slash (*Pinus caribaea* Morel.) and loblolly pine (*P. taeda* L.). Sleeth estimated that the nursery losses because of the disease from 1938 to 1940 exceeded 8,000,000 seedlings of these two species.[2] In a recent year the disease affected 50 percent of the slash pine at two nurseries. Nursery infected seedlings soon die and this stock was unfit for planting.[3]

Sleeth reported effective control of the disease by spraying with Bordeaux mixture.[2] This fungicide is corrosive to metals and must be used immediately. Home-made Bordeaux mixture, which is often used in preference to the ready mixed powder, is relatively difficult to prepare. A single non-corrosive chemical is needed for control of the fusiform rust. This paper reports results of spraying with a number of fungicides in comparison with home-made Bordeaux mixture.

Methods

The work was done each spring at the Ashe Nursery, U. S. Forest Service, Brooklyn, Miss., from 1947 to 1949. A nursery bed 4 feet wide by about 400 feet long sown to slash pine was furnished by the nursery for the tests. All spraying was done with 3-gallon compressed-air hand sprayers at the rate of 1 gallon to 160 square feet of nursery bed.

Date of sowing.—Seed was sown on February 26, 1947, March 18, 1948, and April 11, 1949. As will be discussed later, the date that pine seed is sown has an important bearing on the amount of rust infection in a nursery.

Dates and periodicity of spray treatments.—In 1947 and 1948 spraying began when burlap was removed, on April 11 and April 9, respectively. Plots receiving 15 applications were sprayed twice a week until the middle of May, thereafter once a week. Plots sprayed 10 times were treated once a week. The last application was made June 13, 1947, and June 8, 1948. In 1949 the first spray treatment was applied on April 25 on two plots with the seed germinating under burlap and May 2 on other plots, when burlap was lifted. Plots receiving seven or eight applications were sprayed weekly; those with four applications, bimonthly. The last spraying was on June 15.

Sampling.—The long nursery beds were divided in 1947 and in 1948 into 4- by 10-foot test plots which were sampled twice late in the year by lifting all seedlings in two 1- by 4-foot sections across the plots. This furnished a 20 percent area sample for each treatment. In 1949, the test plots were 10, 20, or 40 feet long and one-tenth the area of each treatment was sampled. For comparison with the fungicidal treatments, five, four, and six plots remained unsprayed in 1947, 1948, and 1949, respectively.

Results of Spray Treatments

1947.—Ferbam showed to advantage in three of five comparative tests with Bordeaux mixture (Table 1). Effective control of the rust was obtained with Dithane Z-78, Goodrite Type 4, and Ziram. Sterox S K appeared to be useful as a spreading agent, but relatively poor control resulted with Goodrite p.e.p.s. when used alone or as an adhesive with Bordeaux mixture or Ferbam. Most of the seedlings in eight plots treated with Phygon[4] were killed.

1948.—Dithane Z-78, Ferbam, and Ziram plus Santomerse S gave better disease control than Bordeaux mixture. Goodrite Type 2 was about as effective as Ziram. Damage apparently induced by dry weather, since no injury was noted in the wet spring of 1947, showed up in the Bordeaux-Sterox plots. The Ferbam-Sterox spray, however, reduced the amount of infection without loss of seedlings. Effective control of the disease, but thin stands and stunted seedlings, resulted from treating with Puratized N 5 E containing Santomerse S.

1949.—The trials in 1949 were limited to Ferbam and Ziram compounds. The reduction in number of cankered seedlings was 83 percent with Ziram and 78 percent with Ferbam in plots sprayed eight times.

The time of sowing pine seed is known to affect the amount of rust infection. Lamb and Sleeth[5] reported infection to be less in beds of slash pine sown late than in beds sown early and Sleeth[2] in Ashe Nursery tests, reported that April-sown slash had only three-fifths as many cankers as that in beds sown a month earlier. In the present study the bed sown latest had the least amount of the disease. Seedlings developing in late-sown beds escape much of the inoculum produced early in April. Moreover, May weather is often too dry and hot for much rust infection.

Increasing the frequency of sprayings gave best results in 1947 when weather conditions in April and May favored infection, and least in the dry spring of 1948.

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[1]The work reported herein was done in cooperation with the administrative branch of the U. S. Forest Service and the Southern Forest Experiment Station, New Orleans, La. Ralph M. Lindgren, senior pathologist of this division, obtained the fungicides and directed the tests.

[2]Sleeth, Bailey. Fusiform rust control in forest-tree nurseries. Phytopath. 33: 33-44. 1943.

[3]Siggers, Paul V. Only 7 of 789 rust infected seedlings live. Miss. Farm Research 12(9):1. 1949.

[4]Phygon (2,3 dichloro- 1,4 napthoquinone) was used at the rate of 2 pounds in 100 gallons of water with 1 pint of Santomerse S or 1 quart of Goodrite p.e.p.s.

[5]Lamb, Howard and Bailey Sleeth. Distribution and suggested control measures for the southern pine fusiform rust. U. S. For. Serv., Southern For. Expt. Sta. Occas. Paper 91. 5 pp. 1940.

TABLE 1.—RESULTS OF SPRAYING TO CONTROL FUSIFORM RUST IN HAND SPRAYED PLOTS, ASHE NURSERY, BROOKLYN, MISS.

Fungicide and spreader[1]	Amount in 100 gal.	Number times sprayed	1947 Seedlings Total	1947 Seedlings Cankered	1948 Seedlings Total	1948 Seedlings Cankered	1949 Seedlings Total	1949 Seedlings Cankered
			No.	*Percent*	*No.*	*Percent*	*No.*	*Percent*
Bordeaux-Goodrite p.e.p.s.	8-8 lbs. + 1 qt.	7	578	8.3				
Do	Do	10	691	8.2	573	2.8		
Bordeaux-Santomerse S	8-8 lbs. + 1 pt.	7	547	7.1				
Do	Do	10	513	5.0	446	2.9		
Do	Do	15	748	1.5	527	2.4		
Bordeaux-Sterox S K	Do[2]	6			444	3.6		
Do	Do	10	486	2.6	348	0.9		
Do	Do	15			475	1.0		
Dithane Z-78-Santomerse S	2 lbs. + 1 pt.	10	524	2.8	549	1.2		
Ferbam-Goodrite p.e.p.s.	2 lbs. + 1 qt.	10	469	3.4				
Ferbam-Santomerse S	2 lbs. + 1 pt.[3]	4					971	4.5
Do	Do	6			543	1.1		
Do	Do	7	539	3.3			1,505	3.1
Do	Do	8					539	0.9
Do	Do	10	618	2.9	515	1.1		
Do	Do	15	696	2.4	534	0.9		
Ferbam-Sterox S K	Do	6			557	1.0		
Do	Do	10	610	2.4	531	1.1		
Do	Do	15			516	1.3		
Goodrite p.e.p.s.	2 qts.	10	774	6.4				
Goodrite Type 2	8 qts.	10			435	0.7		
Goodrite Type 4	8 qts.	10	565	2.6				
Puratized N 5 E—Santo. S	1 pt. + 1 pt.	10			438	0.6		
Ziram-Santomerse S	2 lbs. + 1 pt.[3]	4					731	3.5
Do	Do	6			571	1.9		
Do	Do	7					1,634	3.9
Do	Do	8					654	0.7
Do	Do	10	622	2.6	596	0.6		
Do	Do	15			520	0.4		
Unsprayed seedlings	....	....	1,257	13.4	1,168	5.9	988	4.2

[1]Home-made Bordeaux mixture was made with copper sulphate crystals and hydroxide of lime. Dithane Z-78 is zinc ethylene bis dithiocarbamate. Ferbam is ferric dimethyl dithiocarbamate. Goodrite p.e.p.s. is polyethylene polysulphide latex. Goodrite Type 2 is zinc dimethyl dithiocarbamate, cyclohexilamine complex. Goodrite Type 4 consists of a mixture of Goodrite p.e.p.s. and zinc dimethyl dithiocarbamate cyclohexylamine complex (ratio 7:1). Puratized N 5 E is phenyl-mercuri-triethanol ammonium lactate. Ziram is zinc dimethyl dithiocarbamate. Santomerse S and Sterox S K are liquid spreaders made by the Monsanto Chemical Co.

[2]In May 1948 the amount of Sterox S K was reduced to 0.5 pint in 100 gallons because of injury to seedlings.

[3]In 1949 the quantity of Santomerse S was reduced to 0.5 pint in 100 gallons because of excessive foaminess of sprays containing the larger amount.

The fusiform rust was effectively reduced in 1949 in two plots sprayed eight times, the first time over burlap. On the other hand, seven treatments of other plots commencing a week later, after burlap was removed, were of little value because weather conditions were unfavorable for infection.

Weather and Disease Prevalence 1947-1949

From a study of the germination of teliospores and sporidia of the fusiform rust the writer concluded that the conditions favoring spore production and abundant infection of pine are a minimum of 18 hours, with temperatures between 60° and 79° F., and humidity maintained close to the moisture saturation point.[6] Hypothetically, the seasonal hazard of fusiform rust infection of pines should be greatest whenever the peak of spore production synchronizes with several such combinations of weather conditions.

Spring weather in 1947 was colder than usual and the rainfall, 29.2 inches in 3 months, was above normal. In contrast, in 1948, dry weather at the nursery started the last half of April and continued through May. Meteorological records at a weather station 28 miles away show that the conditions considered favorable to abundant infection of pines prevailed ten times between March 29 and May 31, 1947 and only once in 1948 during the same period. The average percentage of rust infection in 1947 was more than double that in 1948.

Late winter temperatures were all above normal in 1949, and March temperature averaged slightly above normal. The seed in the experimental bed, sown April 11, started to germinate about April 22. Weather records from the Ashe Nursery show that conditions favorable to infection prevailed three times, for 70, 66, and 72 hours, between April 20 and May 2. Thereafter, there was one rain (0.75 inch) in 27 days. Results of the spray tests indicate that weather conditions were conducive to rust infection in April, and that little infection occurred in May.

Discussion

The tests in 1949 demonstrated the value of timing spray treatments with reference to weather conditions as soon as germination starts (Table 1). For example, Plots 1 and 3 were sprayed with Ferbam and Ziram, respectively on the afternoon of April 25. The pine seed was germinating but not enough to justify removal of the burlap cover. From 6 p.m. April

[6]Siggers, P. V. Temperature requirements for germination of spores of *Cronartium fusiform*. Phytopath. 37:855-864. 1947.

25 until 11 a.m. of the 28th, temperature ranged between 62° and 78° F. and humidity remained at the moisture saturation point. From April 29 to May 1 the weather turned warmer but was almost as favorable for pine infection as before. After May 2 the weather was warm and dry. Reduction in the disease in two plots that were sprayed first on April 25 and seven times thereafter amounted to 78 percent with Ferbam and 83 percent with Ziram. In nearby plots, seven sprayings with the same fungicides, starting May 2, reduced the rust only 26 and 7 percent, respectively. The spray treatment on April 25, timed before a period of cool moist weather, reduced the disease more than seven subsequent treatments. Evidently the bulk of rust infection in the test bed occurred between April 25 and May 1, while the seeds were germinating under burlap.

The position on the stems of most of the cankers gave further evidence that much of the infection took place at this time. The usual position of elongated fusiform cankers on nursery stock is at the cotyledon whorl or above it, but in 1949 about 75 percent of the diseased seedlings had cankers centered below the cotyledon whorl on the leafless hypocotyl. With burlap in place, the hypocotyls were closely pressed against the moist soil and exposed to infection through the interstices in the cloth. A suspicion, once expressed, that rust infection could take place on seedlings under burlap was thus confirmed.

Summary

In comparative tests in 1947 with Bordeaux mixture, ten applications of sprays containing Dithane Z-78, Ferbam, and Ziram plus Santomerse S, and of Goodrite Type 4 without a spreader reduced fusiform rust infection on slash pine nursery stock to less than 3 percent, compared with 5 percent for Bordeaux mixture with Santomerse S and 13.4 percent for unsprayed controls. In similar tests in 1948, Dithane Z-78, Ferbam, Goodrite Type 2, and Ziram reduced infection to 1.2 percent or less compared with 2.9 percent for Bordeaux mixture and 5.9 percent for the controls. In trials in 1949 with Ferbam and Ziram, infection was reduced to less than 1 percent compared with 4.2 percent for the controls.

Bordeaux mixture with Goodrite p.e.p.s. gave the least control. Severe damage to seedling stands resulted from spraying with Phygon. Some damage occurred in plots sprayed with Bordeaux-Sterox S K and Puratized N 5 E plus Santomerse S. Santomerse S proved more desirable as a spreader than Sterox S K.

Increasing the number of spray applications gave more effective control in 1947 than in 1948 when weather conditions precluded abundant rust infection. As others have reported, delay in the date of sowing resulted in reducing the amount of the rust.

One spraying in 1949 with Ferbam and Ziram applied just before seven days of cool, moist weather reduced infection more effectively than seven subsequent treatments applied during a dry spell and demonstrated that rust infection may occur as pine seeds germinate under burlap.

First Book on Logging

"The majority of men engaged in logging would probably wonder, if they thought of it, what there can be in it to write a book about and why any one should want to do it.

"That is a very contracted view, of course. To many indeed it seems clear that the industry must change, indeed that it is changing. Operations in some sections are being conducted on a large scale; competition is increasing and traditional methods no longer suffice; the human side of the industry is shifting, while in the background lies the demand for adjustment between the interests of the community and those of the industry. All this indicates that somehow trained intelligence must more and more be applied to its conduct."—From a review by Austin Cary of R. C. Bryant's book *Logging* published in 1913.

A Forest Policy for Bolivia

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THIS ARTICLE is a summary of a study made by the writer during the summer of 1950. The origin of the study was a request made by the Bolivian Government to the Secretary-General of the United Nations that a forester be included in the Technical Aid Mission sent to Bolivia in April 1950. The purpose of the study was to suggest means whereby the forest resources of the country can be exploited to the best permanent advantage of the Bolivian people. Such facts as could be gathered from published material, manuscripts, interviews, and field observations were presented as one part of an overall Bolivian Technical Report. Also included in the forestry section were such interpretations and recommendations as were necessary to propose and justify a forest policy of conservation and renewal.

It is not enough that such a policy be acceptable to foresters. It must appear desirable and imperative to the Bolivian authorities, whose sincere interest in forestry is dulled and distracted by the many problems which confront their country and by the strong traditions of an economy based upon mining and subsistence farming. This primitive form of agriculture, which engages 75 percent of the population of nearly 4 million, has remained unchanged since small grains and livestock were introduced by the Spanish four centuries ago. It is carried on principally in large private or communal ownerships located in the cold and bleak western highlands above the timber line where most Bolivians live and apparently prefer to live.

Such farming yields little surplus for the growing industrial and urban population, and metals must, therefore, be exported to pay for imports from other countries. Such exports (mostly tin) are offered on a highly specialized and fluctuating market.

In many countries a progressive agricultural development has preceded industrialization. In Bolivia the opposite has happened. An active world demand for metals has pulled this isolated plateau headlong into the global scene while her agriculture has plodded far behind with oxen and wooden hoes. The result is an economic monstrosity of the first order.

Forest Description

Geographically speaking, Bolivia has been left little better off by her chaotic post-colonial history. In spite of being almost tragically dependent upon foreign trade, she has no direct outlet to the sea. Her huge eastern lowlands, rich in forests, soils, and water, send their rivers towards foreign lands, and are separated from the upland plateau by a tremendous mountain barrier which has not yet been successfully breached except by air traffic.

This fact accounts for the primeval condition of 128 million acres of forest cover containing an estimated 265 billion board feet of timber and well over 2,000 species located eastward from the crest of the Andes. Forest types are of extreme complexity as regards composition, size classes, and quality, and are made up entirely of evergreen and deciduous hardwoods.

From every point of view by which a forest can be valued, the most important part of this forest lies on the eastern foothills of the Andes and out onto the flatlands of the Amazon and Paraguay river basins in a belt roughly 100 miles broad but whose exact width varies with the amount and distribution of rainfall. From the Argentine border north to the city of Santa Cruz, this forest favors such hard, heavy species as quebracho (*Shinopsis* sp.), walnut (*Juglans* sp.) and various species of *Tabebuia*. At Santa Cruz the Andes veer sharply and run northwest toward the Peruvian border. In this position they intercept heavy rain clouds drifting up the Amazon Valley and give rise to one of the densest and richest forests in the world.

Northeast of this belt, in north-central Bolivia, there is a very large tract of grassland, maintained and increased by annual range fires. The forest, however, persists in wide belts along the rivers. Roughly at the 12th parallel south these belts converge and form a continuous forest between the Peruvian and Brazilian frontiers.

Eastward from Santa Cruz and south to the Paraguayan Chaco rainfall becomes less and the forest cover becomes lower, more open, and scrubby.

The question as to what extent the western highland region of Bolivia was once forested is complicated by an agricultural history of many centuries. The farmers and herders who, long ago, had mastered the arts of irrigation and terracing, knew no restraint regarding trees. Still less did their conquerors from the bleak uplands of central Spain. Native trees such as molle (*Schinus molle*), kishuara (*Buddleia* sp.), pino de monte (*Podocarpus* sp.), and kenua (*Polylepsis tarapacana*) still grow here—in the case of the kenua to an altitude of 15,000 feet; but they do not form associations capable of establishing forest influences. They are seen as odd and scattered trees, shading a farmstead, marking a boundary or ineffectually battling against stray donkeys and goats in a city street. These trees are seldom cut down. They have great staying power and survive for years as they are gradually hacked to pieces—a limb here and a branch there to provide fuel for the next meal.

Forest Utilization

Constant struggle for fuel is, indeed, an outstanding and critical feature of life on the Bolivian Altiplano. Animal manure is regularly burned instead of being returned to the impoverished soil. Food is ill prepared, and housing is crowded for the sake of warmth. The fact that Bolivia has 32 acres of forest land for every inhabitant is of no import to an Indian family shivering in a hut 14,000 feet above sea-level.

The capital city of La Paz reveals striking instances of wood starvation and also the lengths to which Paceños will go to get and make use of forest products. Lumber arrives by plane from Riberalta, 500 miles to the north. Pine packing cases are knocked apart and used for flooring, furniture, and cabinets. Charcoal is brought from Mt. Sajama, 250 miles from La Paz and 100 miles from a railway. Eucalyptus leaves are raked up and sold for fuel at 5 cents a bushel.

Although the mines and the railroads which were built to transport their products, become large and regular users of wood half a century ago, they did not foster a domestic lumber industry. Instead they depended upon foreign imports and still would be doing so were not Douglas-fir from Oregon and quebracho from the Argentine more difficult to buy each year.

Apart from these activities, Bolivia has always had a low consumption of wood. Her inhabitants have not been a wood-using, forest-dwelling race. As a result forest exploitation has practically been confined to two types of use, both of which indicate primary stages of forest development.

One of these consists of a local, handcraft trade in household and agricultural implements which, although of great importance to daily life, does not give the forest from which they come a national significance.

The second type of exploitation is represented by such secondary products as cinchona bark, Brazil nuts, and natural rubber. As is inevitably the case, such unregulated exploitation of the wild woodland is purely destructive. The cinchona trees have been largely cut off and their bark has ceased to be a significant article of trade. Rubber-gathering is currently enjoying a boom. However, the industry is hardly a healthy one, either for the workers themselves, or for the shaky economy. Bolivia has undergone several rubber booms and is learning to be wary of their catastrophic effect upon her agriculture.

Within the last two decades another type of forest industry—an active and expanding lumber industry—has appeared in response to the demands of the growing industrial and urban population for wood in quantities and forms not available either from imports or from handcraft shops. No statistics are available as to production, capacity, products, or plant location. However, it is estimated that about 10 million board feet were sawed in 1949, and that in 1950 this figure may reach 20 million; this would represent about half of Bolivian consumption of lumber, but by no means her needs.

There are in Bolivia about seventy sawmills, most of which are located in the Andean foothills. Their product is almost invariably rough lumber sawed into 9 foot lengths—a length calculated long ago to rest most securely on the back of a mule. Lumber is now measured in board feet, although for taxation purposes the *mula*, a rather vague term relating to the carrying capacity of a mule, is often specified.

Bolivian sawmills are, with few exceptions, underpowered and overmanned for reasons that are easier to discover than to correct. Gasoline (steam boilers are seldom used) must often be trucked and even flown at great expense to the mill, where wages are sometimes as low as 12 cents a day and board. The mills are usually of the rotary, portable type familiar in eastern and southern United States and poorly adapted to heavy tropical woods. Felling is done with axes, and logs are rolled about without help of cant hooks.

The movement of sawmill products is westward from the lowlands to the large cities of the highlands. Very little is used locally because the region of manufacture is poor and sparsely settled.

The difficulties of manufacturing lumber from a complex tropical forest under primitive conditions are accentuated in Bolivia by several special factors. One of these is the multitude of petty taxes levied by local authorities which hinder the flow of trade and yield no revenue of importance. Another is the subsidy to imports brought about by the overvaluation of the unit of currency, the *boliviano*.

A third factor arises from the overall question of land tenure. Bolivia, in common with other Latin American countries, inherited from Spain a pattern of land ownership whose basis is quite distinct from that prevalent in the United States or Canada. Land is not primarily held for speculative or development purposes—it is held for motives of social prestige. Aside from such prestige, it is given economic value by the presence of Indians attached to it in various forms of peonage. Incentives for investment or development are lacking because no land tax of significance is required and because cash wages are seldom paid to the peons. Titles and boundaries drift into a chaotic state of neglect. The government itself has abetted this system by handing out huge tracts with no serious provision for payment, use, or taxes. Just how much land is now held by the public and how much by private ownership is a question impossible to answer.

A situation more thoroughly unfavorable to the orderly and sustained management of timber resources can hardly be imagined. Silviculture aside, however, operators are still faced with the difficulty of acquiring a clear right to stumpage. They too easily become involved in disputes which lead to endless litigation and even physical combat.

The seriousness of this problem was vividly presented to the writer by attendance at one such combat staged miles back in the deep mahogany jungle. Here two logging crews faced each other with cocked rifles and drawn machetes while their leaders hurled threats and curses at each other for some two hours. The fact that the timber over which they were quarrelling belonged in fact to an unrepresented third party indicates the urgent need for a strong and effective authority to protect ownership rights.

Lumbering has not yet reached a scale large enough to threaten

the forest cover as such. True, a deterioration in composition is taking place as stands are high-graded for mahogany, Spanish cedar, walnut, and a few other species. However devastation in the sense of destroying the forest cover and exposing the soil to erosion is principally an agricultural problem. It arises from the vicious *chaco* system of shifting cultivation. Patches of woodland are felled, burned, farmed for a few years, and abandoned once more to the jungle growth—a system widely used in tropical regions throughout the world. Where the population is sparse, it can be practiced without permanent harm. Where pressure on the land mounts steadily as in the Yungas valleys northeast of La Paz, this type of agriculture can create a desert in a few generations. Eroded slopes are not yet common in this region, but they do exist and serve as an indication of what may take place on a large scale.

The fire problem is already acute through the heart of eastern Bolivia, from Corumba on the Brazilian border to Santa Cruz at the foot of the Andes, where a railway is under construction. This line crosses a dry, open forest whose inflammibility in the winter months reaches an explosive stage.

Probably these woods have been burned by the Indians for centuries. A nomadic people, they do not use regular paths but follow their whim and intuition in their perennial search for wild honey, reptiles, and edible palms. They find the going more convenient through a burned forest and hence they set fires without scruple. The Indians' pyric balance with nature has been upset by the railway's use of wood for fuel. The very agency which needs the trees for power, ties, and lumber is destroying them at such a rate that it will soon traverse a wasteland. This same cycle has been repeated so often in Brazil and in other tropical countries as to be readily predictable.

Forest Policy Recommendations

Any specific points of forest policy recommended for Bolivia presuppose that this country will, within the next few years, achieve a degree of economic stability and political maturity in which long-range purposes can be carried out in the light of scientific knowledge and in the hope of monetary return. Once Bolivia enters this stage, private industry can be counted upon to supply the capital, initiative, and ultimately, the forest products which the country needs. The danger to her timber resources will arise from a failure to realize how quickly forest exploitation can develop and how slowly forest management operates to rebuild the resource once it has been devastated. Therefore a strong public forest policy must be established immediately.

The general lines which such a policy should follow in Bolivia are basically no different from those of other countries which can count commercial woodland among the natural resources and which have reached a stage of economic progress wherein forest land has a national rather than a local import.

The two fundamental points of forest policy are stated most briefly as follows:

First, the forest shall be managed so as to yield the greatest return in forest products and forest influences consistent with the long-range welfare of all the Bolivian people.

Second, the forests shall not be overcut, high-graded, or burned, or otherwise exploited except in such a way as to develop and maintain this high yield.

In order to carry out these policies, strong public leadership is absolutely essential. The practice of handing out huge tracts of land without serious provision for use, payment, or taxes, must stop. A definite effort must be made to establish clear titles and boundaries. Public lands should be turned over to colonists as they are needed, but only after they have been judged suitable for permanent agriculture. Otherwise they should be retained in public ownership and organized into units for long-term management.

In order that all phases of land use planning can be carried out simultaneously, an aerial survey on a scale of 1/20,000 should be made of critical areas. Intensive local surveys of all the resources are more urgent than an over-all forest survey at the present time.

The responsibility for managing public forest land will rest with a forest service, backed with enough money and interest to become an effective agency for carrying out the forest policy of the country. This service will be headed by a chief forester advised by a forest council of seven members appointed by the President of the Republic.

In managing public forests, concessions for logging will be granted only in return for ground rent and stumpage. In order to ensure that part of the income so received will be reinvested in forestry, two-thirds of the receipts will be retained in a forestry fund and one-third turned over to the national treasury. An attempt should be made to direct exploitation to lands that are near means of transport and that are being cleared for agriculture. Primary consideration should be given such land; and secondary consideration to those outside the present economy.

In order to place the management of national forests upon a scientific basis, another forester must be employed to study the dendrology and silvicultural characteristics of the native species, together with their volume and range.

A forest products specialist is needed to aid industry toward expansion and efficient operation through the study of such subjects as equipment, plant location, better products, foreign and domestic markets and capital, statistics of production, and standardization of trade practices. A thorough and systematic study of the physical properties of native timbers is needed in order to relieve the pressure on mahogany. Bolivia's own needs should be met first, but the resources to develop a steady and profitable foreign market are present and cannot be overlooked.

Since there is not more than one trained forester in Bolivia, at least the chief and two other foresters must be sought outside the country.

Eventually the duties of the forest service will have to devolve upon Bolivians, and the Forestry Department at the University of Cochabamba should be built up with this fact in view.

Forest plantations, at present practically confined to eucalyptus about La Paz and Cochabamba, should be greatly expanded, with emphasis upon native trees and the means of getting the trees onto the land.

The problem of wild fires in eastern Bolivia is perhaps not capable of solution at present. All that can be hoped for is a determined effort by the forest service, the army, and the railway commission to bring under protection the forest land adjacent to the tracks.

The authority to control both fire and cutting on private lands is contained in a decree of June 20, 1939 which prohibits the destruction of the forest environment except where permission has been granted by the Minister of Agriculture. Bolivia does not now have the means to enforce this decree. It is, however, a law fundamental to the protection of the forest area and one whose enforcement should eventually be entrusted to officers of the forest service. Its urgency will depend upon the amount of land found to be in private ownership so placed that it has a high protective as well as productive value.

These recommendations are made in the light of a special and urgent situation in a comparatively underdeveloped country. They do not take the place of continuous and careful study of all factors and for forest legislation flexible enough to meet changing conditions. In each case, such legislation should be founded upon scientific knowledge and should take into account the customs and needs of the people. Above all, each law must provide for the money and manpower to carry out its provisions. Finally, all such legislation must have a consistent bearing on the long-range objective of formulating a program of sustained-yield forestry within the tenets of modern democratic societies and acceptable to private ownership.

Getting the Most from Your Summer Work

Kenneth P. Davis
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This is written directly to forestry school students about their summer jobs. Students participate substantially in the summer work of several forestry organizations. Their sound development is of the utmost concern to the profession, and anything that will help them do a better job and become better foresters is of importance. Students and employers alike will find this article of interest. It has been distilled from study of many summer work reports and many talks with both students and employers.

FORESTRY SCHOOLS have long recognized field employment during the summer as an essential part of your professional preparation prior to graduation. Forestry has an earthy core; much of it is concerned with doing practical things on the ground. Men who aspire to professional positions need thorough apprenticeship in the field work of forestry. The sooner you begin building a solid background of field experience the better. Summer jobs while going to school offer a valuable opportunity. Comparatively little of the practice of forestry can be learned in the classroom.

You are always being tested and watched on these summer jobs, usually more than you think and your performance is a matter of record. Sometimes you may even be assigned the tougher jobs because you are a forestry student and the boss wants to see whether you can take it. A new man is often put on whatever job happens to be currently available. If he sticks and makes a go of it, he is then considered for a job of higher responsibility. You may think you are forgotten—but you aren't.

Through summer jobs you develop contacts and reputation for employment after graduation.

Consequently, you want to get the most benefit possible from your summer jobs. Two things are especially important. The first is to get all the education and information you can out of them. Look around, see what's going on, read things, observe, ask questions, get a feel for the job as a whole, even though you may be working only on a rather narrow segment of it. Almost all jobs have large possibilities in this direction that go far beyond your actual daily work. The second is to make good on the job to which you are assigned regardless of what it may be, whether or not you happen to be interested particularly in that specific part of forestry.

As an aid in getting the most from your practical field work, the following is a listing and brief discussion of things you should watch; things the employer looks for and expects; things that have caused difficulty in the past. The list has been developed from student summer work reports and discussions with many employers. Some of them may apply to you. They are not given in any order of importance as all are important; difficulties in any of them can often nullify good work in other respects. They apply to any employment, permanent or temporary.

1. *Neatness of appearance, general self-pride in looking well.*—While one cannot be dressed-up in

the woods and appropriate woods clothing should certainly be worn, there's no point in "going native." This is important where men are hired for jobs that involve public relations. The public always judges an organization by its representatives, and when on the job you are a representative. Look and act like a good one.

2. *Attention to instructions.*—Nothing is more irritating to an employer than to try to explain something to a man who just doesn't seem to pay attention, and who later on the job obviously demonstrates that he didn't get it straight. You must also remember that the boss isn't always good at giving instructions. Further, in our American way of life, supervisors usually dislike making instructions sound like orders. This is particularly true in the woods where it is traditional to give instructions in an informal, rather casual manner. Make a point of trying to get things straight. Everything cannot be spelled out, of course, and you will have to strike a practical balance between what you should supply in common sense and good judgment, and what guide lines are really needed from the boss. He will not tell you everything. When it falls to you to give instructions, take pains to do it carefully and well.

3. *Judgment.* — On personnel reports one sometimes sees the statement that the employee showed poor judgment. It is often baffling to know what is actually meant and the employee himself may be unaware of just how and where he showed poor judgment. Some things often lumped under the category of poor judgment are:

a. Inability to follow instructions intelligently; to see beyond details to accomplishment of the job as a whole.

b. Failure to think things through; the tendency to go off half-cocked.

c. Inability to sift out the important from the less important; failure to put first things first. Lack of a sense of balance and proportion. Certain key things have to be done and it is important to realize which they are.

d. Inconsistent quality of work and general performance —good one day and not so good another. Employers like men they can count on for consistent performance and discount the judgment of the up-and-down boys.

e. Just plain bulls. Everybody makes them and a few honestly made are forgiven. All you can hope is that you will not make them too often and seldom more than one of the same kind.

4. *Enthusiasm and interest in the job.*—Employers look for this and note a lack of reasonable interest. Try to become and seem really interested in what you are doing. Remember that regardless of what you think your ultimate interests are and what you may think of the particular job you are on, it is nonetheless important that you do that job well as long as you are on it. It is a part of your performance record.

5. *Industry, willingness to work.*—If you become known as a "good worker," there will always be a job for you. This means combining quality and quantity in good balance. It also means willingness to pitch in and push ahead regardless of circumstances. Do your job faithfully regardless of reasons you can think up as to why it doesn't matter. Avoid undue awareness of starting and quitting time. Remember that most supervisory people in forestry grew up in an earlier era before we became so conscious of 40-hour weeks, overtime, etc. Regular hours should, of course, be observed in so far as practicable, and ability to do your job in the regular time allotted is usually evidence of good planning and organization. On the other hand, many woods jobs simply do not lend themselves to factory hours.

6. *Willingness to accept criticism and ability to profit from it.* —Always remember that it is just as hard to give as to receive criticism. Make it easy rather than difficult for the boss to help you. Many supervisors will go to almost any length to avoid giving criticism and when they finally feel that something must be said, blurt it out not too effectively. It is also hard to accept criticism and yet you can profit a great deal from it. Just remember there are two sides to this; and it is important that you get constructive review of your work. Even though you may not agree, constructive criticism is still something to heed because there is usually at least some truth to it. Unfavorable truths always hurt —a little anyway.

7. *Initiative or "self-starterism."*—Usually looked for even though sometimes not apparently invited. Men sometimes get the impression that the boss does not want any display of initiative. Almost always this isn't true. Sometimes a man gets such an impression when he thinks he knows what should be done but really doesn't; do not confuse initiative with brash ignorance. Initiative in the face of apparent indifference is precious and strangely enough, men who seemingly encourage it the least often appreciate it the most.

8. *Care and skill in the use of equipment and tools.*—Few things are more exasperating than to have a man on the job who won't take care of tools and equipment, who thinks nothing of leaving them dirty, and seemingly has little interest in learning to use them safely and effectively. An out-of-door background surely helps, but much will be forgiven the inexperienced if he makes a real attempt to learn, and anybody can be careful in handling property. Good craftsmanship in the woods is unfortunately becoming scarcer and scarcer, yet the fact remains that the actual accomplishment of many jobs in the woods calls for real skill in the use of tools and equipment.

9. *Safety.*—There are many natural and man-made hazards in the woods and all forest organizations make determined efforts to prevent accidents. Cooperate fully, be alert and remember that the safest way is the best and most efficient way.

10. *Foremanship.*—The ability to lead and direct the work of others is always looked for and is particularly important to foresters, as

most of you look forward to positions of some administrative responsibility. It is often easier to do the job yourself than to get others to do it—but that's not foremanship. Remember that in private industry, as in government service, men are usually employed initially at the bottom with positions of higher responsibility being given to those who show ability to assume responsibility. Foremanship, or leadership in general, is one thing employers are always seeking. Be a leader, not a dictator. Show respect, consideration, and appreciation for the suggestions and ideas of subordinates and co-workers.

11. *Willingness to accept responsibility.*—This is closely allied to foremanship and always sought. Men in higher level jobs are paid primarily for the responsibility they are capable of assuming.

12. *Sticking on the job.*—Employers of students during the summer sometimes report that students quit before the job was done for what seemed insufficient reason. This can raise a serious question as to sense of responsibility and professional interest.

13. *Awareness of what is going on around you.*—People and organizations are no more perfect than you are. It might happen that you step into a situation where personal relationships are difficult; where your boss is under pressure, or where there is bad division of responsibility and authority and you are caught in between. Sense these things; do your job, and do not become a participant in bunkhouse politics.

14. *Neatness, accuracy.* — This applies both to field and office work. A man who turns out sloppy, careless, and semi-intelligible looking work has a bad point scored against him regardless of his other abilities.

15. *Communication, ability to write and speak effectively.*—Since so much of today's business is expressed on paper or through the spoken word, it is inevitable that much of the impression an employer gets of a subordinate is received through the medium of written or spoken communications.

16. *Cooperativeness, ability to get along with others.*—This is important in all walks of life and certainly so in forestry where it so often happens that small groups work closely together. Avoid antagonisms, irritations, breaks, etc. If a situation does become intolerable and you are absolutely sure you are right, it is wise to talk it over with your supervisor.

17. *Cheerfulness.*—Don't be a sourpuss or a griper. This doesn't mean you should bubble with cheer all the time but do try to look at the brighter side. It helps everybody, but mostly yourself.

18. *Ability to organize a job and carry it through to the finish.*—This is a precious ability and is gratefully appreciated. So many times a man will do part of the job, perhaps very well, but will not stay with it until it is entirely finished down to the last detail. It gives an employer great satisfaction to have a man to whom he can assign a job and know that it will be finished. Conversely, it is most irritating to have to spend much of your time buttoning up and finishing jobs that others have half done.

19. *Integrity, courage, character, and intelligence.*—These are musts everywhere and certainly in forestry.

20. *Conceit.*—This may take many forms and is always resented. You have to be awfully good to afford any display of conceit. If you are good there is no need for it; if you're not good, it is disastrous.

21. *Technical ability.*—Technical ability, particularly as you acquire it in school which of necessity stresses the theoretical, often seems of secondary importance in entering jobs and frequently is. At the outset it often is not as important as native intelligence, willingness, industry, etc., although in the longer pull you will need all the technical ability you have. Employers tend to take a reasonable level of technical skill for granted; in fact, they sometimes expect more than they should.

22. *Physical fitness.* — Reasonable robustness of body is an important advantage, particularly on apprenticeship jobs. It isn't so much a matter of actual strength and size as general all-around health, endurance, and ability to do active outdoor work. This becomes particularly important when a man is called upon for fire suppression and other emergency work, as most foresters are at one time or another.

23. *Ability to grow.*—This is one of the main things an employer seeks. A man may be awkward and inexperienced and make his share of mistakes. Yet, if he seems to have the capacity to profit by his mistakes and grow on the job, much will be forgiven. You must remember that your education is never over; if it ever stops, you go backwards. Ten or twenty years after you leave school, you will be hard put to remember what you learned in school and what you learned elsewhere.

24. *Temperament.*—This is a rather intangible and almost indefinable thing, but none the less important. Men whose interests center in city life, for example, seldom make good foresters. Also men who have little liking or appreciation for out-of-doors work as a regular thing seldom make good foresters, even though in higher jobs a forester may spend a good deal of time behind a desk. Employers commonly note on student personnel reports whether a man seems to have a temperament and attitude suitable for a forester.

25. *Making adjustments.*—You are what your heredity and background have made you and inevitably tend to judge by the standards and habits by which you have lived. Cultivate tolerance and interest in the ways and habits of other people and groups. With many, your background is not of field and forest, and everything you say and do may show the fact to the eye of an experienced forester. This is no reflection on you whatever, but you must remember that on the job it is up to you to make adjustment to what may be a new environment. Weigh your actions, thoughts, and words accordingly, and face up to the realities of the job-standards and habits of your employer.

Notes

International Commission for Plant Slide Exchanges

For many years there has existed a need for some method whereby microscope slides of plants from all over the world could be made available to those needing them. In the newly published *Anatomy of Dicotyledons* Metcalfe stresses the importance of building up reference collections of slides, particularly at every institution where taxonomic investigations are carried on. Many, if not most, such institutions lack the personnel and facilities for the preparation of slides, and there are also difficulties in the way of securing the necessary material from other regions.

The most practical method of obviating all the difficulties appeared to be the establishment of an International Commission for Plant Slide Exchanges, to which materials might be sent for processing and from which participants could receive any available slides in exchange. This commission has now been established under the auspices of the Botanical Section of the International Union of Biological Sciences in cooperation with the California Botanical Materials Company, in the laboratories of which the materials will be processed.

The aim of the commission is to enable cooperating institutions and individuals to build up reference slide collections by exchanging plant materials sent in by them for slides processed from either these materials or from those forwarded by others.

Any individual botanist, department of botany, or botanical institution may become a member of the commission upon payment in advance of an annual fee of ten dollars. Fees will be used solely for overhead expenses such as the preparation of lists of slides, slide boxes, postage, clerical assistance, etc.

Members are expected to collect and fix properly for slide-making purposes plant materials indigenous to their respective regions or collected elsewhere by themselves. All plants from the algae on are to be included, as are all plant structures. The two standard microtechnique manuals should be used for guidance in collecting: Johansen, *Plant Microtechnique*, or Sass, *Elements of Botanical Microtechnique*. If desired, detailed instructions concerning specific plants may be obtained from the chairman. Each collection should be sufficient for a minimum of 2,000 slides. A series of developmental stages is far more preferable than material all of one stage. Materials are to be shipped in fluid to the commission, carriage charges to be borne by the shipper. Each collection must be accurately identified as to genus, species, and structure, and each species should be accompanied by a herbarium voucher giving all requisite data. These specimens will be deposited by the commission in the Herbarium of Pomona College, and will be available on loan.

Each collection, upon receipt and acceptance by the commission, will be given an exchange value of 10 slides. Materials which duplicate those previously sent by others may be given a lesser exchange value, depending upon their usefulness.

Members are entitled to receive in exchange any slides that they desire, up to the total of their allowances, whether these are prepared from materials sent by themselves or by others. An indication of what is desired should accompany the material and lists of available slides will be returned for selection.

The extensive slide collections of the California Botanical Materials Company, numbering in excess of 6,000 individual items, will be used as a nucleus for exchange purposes.

Slides will not be received for exchange. The commission does not duplicate the aims or purposes of the International Depository of Cytological Slides. However, one example of all cytological slides processed by the commission will be sent to the depository.

In return for its services and for providing the necessary supplies, the California Botanical Materials Company has been authorized by the council of the Botanical Section of the International Union of Biological Sciences to sell, at its established prices, surplus slides of any materials forwarded to the commission, to any who may desire them without becoming members of the commission.

DR. D. A. JOHANSEN, *Chairman,*
International Commission
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Concluding Notes on a Larch Plantation

For two decades and more, it has been my good fortune to watch the year-by-year development of a small stand of European larch, the first plantation that I made on my forest near Stephentown, N. Y. And, for twenty years, its spectacular development has been a source of pride to its owner and astonishment to others. The JOURNAL has carried two previous reports covering development at the end of the fifth, tenth, and fifteenth years.[1] This one covers the twentieth growing season a thinning made early in the twenty-first and the end of the story.

Since last report (1946)[2] three summers out of five have been dry, one of these being the very bad season of 1947. Because it has a long growing season—over 100 days—larch is somewhat sensitive to late summer drought. The winter of 1947-48 was the most severe on record—even worse than notorious 1933. Despite all this, growth in both diameter and height continued at a rapid pace.

[1]Cook, David B. Notes on a larch plantation. Jour. Forestry 39(7):647. July 1941.

[2]Cook, David B. Further notes on a larch plantation. Jour. Forestry 44(1): 58. January, 1946.

Measurements of the 1/10th-acre sample plot at the end of the twentieth season show that, of the original 103 trees, 11 had been cut in a light thinning (1946), 2 had been killed by lightning, 19 had died of suppression, bringing the number of living trees down to 71. Of these, 29 were Class I trees, 30 Class II, 10 Class III, while only 2 Class IV trees were still alive.

These 71 trees had a basal area of 14.16 square feet, up from 11.28 square feet five years before; the 1946 thinning had removed 1.00 square foot. Basal area accumulation has slacked off only moderately. At the same time, the average diameter of all trees had risen from 4.4 inches to 6.1 inches, that of the Class I and II trees from 5.2 inches to 6.4 inches. Average height of dominants was estimated at 50 feet, up from 40 feet. Because of the dense stocking and good height, considerable crown friction had developed and the live crown had decreased to about half the height. The largest tree (No. 77) was 8.5 inches d.b.h., 55 feet tall—quite a stick for twenty years.

Statistically, this stand exceeded in both height and volume, the yield table requirements for Site I in the Northeast, in Sweden and in Britain. Professor F. C. Hummel of the British Forestry Commission, commenting on the data, stated that, in Britain "1st quality European larch is only 40 feet at 20 years instead of 50 feet." As my stand was too tall to measure with a pole and too dense for an hypsometer, height had been taken by ocular estimate. I began to think I had been over-optimistic. But, subsequently, cut trees were measured on the ground. Three Class I trees averaged 51 feet, 16 Class IIs 47½ feet. Dominants cut outside the plot ranged from 47 to 55 feet. Stating the "average height of dominants" as 50 feet is, therefore, substantially correct.

Now, 142 square feet of basal area per acre, on 710 trees, represents a very considerable overstocking. The choice was to let the stand alone and invite stagnation, or to thin. Even though the trees to come out had only just reached merchantability, it was decided to cut the basal area back to about 100 feet by removing codominants and a few dominants. Only trees of reasonable merchantability—5 inches d.b.h.—were to be taken. In June of 1950, three Class I and 16 Class II trees, with an average diameter of 5.8 inches (4.6" to 8") were cut and peeled. This reduced the basal area to 10.7 square feet, the number of trees to 52. It increased the average diameter from 6.4" to 6.7". It freed at least two sides of every remaining crown in the main canopy.

The cut produced a stacked volume of .75 cord of peeled wood or 7½ cords per acre. Inasmuch as the cut was in "average" trees—mostly Class IIs—it seems safe to infer that the stand has produced thirty cords in 20 years, and on merchantable stems, not bean poles.

It is obvious that, even on this good site, the original 6x6 spacing was too close. In twenty years, we had lost 11 trees cut in a light thinning from below, 19 that had died of suppression; 10 Class III and 2 Class IV trees were doomed but not dead. We would have been as well off with about 60 trees as we were with 103.

Perhaps we foresters should take a long look at the possibilities for wood production offered by good larch plantations. At least in the short run, they can produce valuable, *merchantable* volume sooner and at a faster rate than any other conifer commonly planted in the Northeast.

This report was prepared last autumn. On November 25, the Great Wind blew the heart out of this little plantation, wrecked the sample plot, put an end to a remarkable story. While it was a cruel and irreparable blow, the stand did, in only twenty years, show something of what larch at its best could do. It was an impressive lesson.

DAVID B. COOK,
Albany, N. Y.

Forestry and Foresters

"In the administration of the national forest reserves, in the introduction of conservative lumbering on the timber tract of the lumberman and the woodlot of the farmer, in the practical solution of forest problems which affect well nigh every industry and every activity of the nation, the members of this society have an unexampled field before them. You have a heavy responsibility—every man that does serious work, work worth doing, has on him a heavy responsibility—for upon the development of your work the development of forestry in the United States and the production of the industries which depend upon it will largely rest. You have made a good beginning, and I congratulate you upon it. Not only is a sound national forest policy coming rapidly into being, but the lumbermen of the country are proving their interest in forestry by practicing it."—From an address by President Theodore Roosevelt delivered before the Society of American Foresters on March 26, 1903.

Points of View

Power Lines Reduce Forest Acreage

I have been deeply impressed and alarmed during the past five years in my travels throughout the country to see the heavy inroads which are being made by power line rights-of-way into the commercial timberland of our nation. Many of the power line rights-of-way are several hundred feet in width and traverse some of the finest commercial timber growing land in the country. Anyone who travels today extensively by air is bound to realize that the aggregate loss of productive timberland to the steadily encroaching power line rights-of-way is amounting to thousands upon thousands of acres.

Likewise, anyone engaged in the management of private timberland is daily impressed by the number of requests for power line rights-of-way which are sought by both public and private utilities. Needless to say, the thousands of acres that have been lost to these rights-of-way to date and the acres of timberland that will become rights-of-way in the future are permanently lost from our total acreage of commercial forest land.

It strikes me that some appropriate committee or section of the Society should take this growing problem under consideration. I believe that some group of professional men in the Society could carry this problem to an appropriate utility company or utility association and through them stimulate research in the development of a form of power transmission conduit which could be laid beneath the ground, thereby eliminating the overhead power transmission equipment now in conventional use. This would in turn substantially reduce the width of rights-of-way needed for power transmission.

Undoubtedly the electrical equipment manufacturers and utilities have done some exploratory work in the field of underground conduit transmission of electric power. However, such work might be stimulated or given higher priority if the Society were to express its concern and deep interest in solving this problem.

If the development of economic and efficient underground electric conduits were successful, it might also lead the power companies into a field of greater economy in constructing and maintaining power transmission systems. Conduits could undoubtedly be laid by the same type of mobile tractor powered units which are now widely employed in laying pipe lines and coaxial television cables.

M. H. COLLET,
West Virginia Pulp and Paper Co.
New York.

More on Modern Misstatements

I was glad to see in your August 1950 JOURNAL Mr. Recknagel's sound comments on the book *Green Glory*, by Mr. St. Barbe Baker whom he describes as an ex-British colonial forest officer. May I, as one who was an active member of the British Colonial Forest Service for a great deal longer than Baker was, assure you that Baker's writings do not reflect the views of that service.

I was surprised to read a review of *Green Glory* in your January 1950 JOURNAL. It was not noticed in the *Empire Forestry Review*, and is not to be found in the Imperial Forestry Institute Library.

Professional foresters on this side of the Atlantic do not write much for the general public, and their attitude to such books as *Green Glory* reflects what is possibly a feeling of guilt in this respect. They deplore and laugh about crude exploitation of theories such as that of the "encroaching desert," but only among themselves, and they hesitate to do so in public because of a faint hope that the purple propaganda may just possibly help to create a demand for better land management by qualified men.

The moral surely is that the true role of forestry in rural and industrial economy ought to be explained more often in popular but accurate language by experienced foresters themselves. The booklet, *Your Trees—A Crop*, reviewed by Recknagel in your August 1950 JOURNAL appears to deal soundly with some of the aspects which should be presented in this way.

N. V. BRASNETT,
Imperial Forestry Institute,
University of Oxford, England.

Use Value vs. Market Value

In a recent issue of the JOURNAL Ralph Marquis presents a thought-provoking discussion of social values and their relation to public policies concerning forests.[1] The various goods and services grouped as social values are not acted upon by the usual market mechanism, with the result that no direct market expression of their value is available. This has resulted in considerable difficulty for economists in attempting to evaluate programs and policies involving such social benefits. The economic unit of measure is money, and only values expressed in monetary terms can enter directly into the economic calculus. In turn the efforts of economists to surmount this problem have frequently caused difficulty for other thoughtful men who have felt intuitively (and strongly) that certain actions were needed even though "economic analysis" did not bear this out.

The result of this contretemps has often been the discarding of economic analysis entirely rather than the seeking out of the true culprit—an inadequate model for the analysis or inadequate data in developing the analysis. This is

[1]Marquis, Ralph W. Dollar signs and social values. Jour. Forestry 49: 107-108. Feb., 1951.

unfortunate, since the economic argument is a peculiarly effective basis for obtaining action. The solution is to strengthen and to improve economic analysis, not to mutilate it further.

There is much that is useful and instructive in Marquis' discussion of the practical difficulties in the application of monetary values to "these so-called social benefits." However, in his discussion of the theoretical difficulty in determining such monetary values he indicates that the economic tool not only has often been misapplied but also is frequently inappropriate. Here his argument goes astray.

Marquis distinguishes between "value in use" and "value in exchange," explaining that for either concept of value a good or service must be capable of satisfying human wants, but that to have market value the good or service must also be scarce. He then states: "The greater the quantity of goods or services produced the greater the value in use or intrinsic value will be." This statement is not correct. There is a limit to the quantity of even a free good that will be consumed by society. An increase in supply beyond this satiation point will not be used and so will result in no increase in the value in use of the good.

For example, if bread were available free of charge the amount which would be consumed would be finite. Any bread beyond this amount would be simply allowed to rot. Similarly, the development of campgrounds to enable recreational use of the forest could be carried to such a point that additional campgrounds would not be used and so would contribute nothing to value in use.

Moreover, the closer the supply is to this satiation point the less important it becomes for society to devote effort to increasing the supply. This is the point that Marquis overlooks in his argument that value in use, not value in exchange, should guide public policy. Where air is superabundant, as in the forest, society expends no effort to make air available. Where air is scarce, as in a tunnel, society willingly goes to substantial effort to obtain an increase in the air available. It is the combined effect of usefulness and scarcity of a good or service which determines the degree to which society should expend effort in increasing the supply. And it is just this combined effect of usefulness and scarcity which is measured by market price or value in exchange.

Marquis places too much emphasis on the traditional market mechanism and too little on the true nature of market value. The citizen in the voting booth establishes a value in exchange as surely as do the buyer and seller in the market place. By rejecting one school bond issue and passing another, the voter places a value in exchange upon the benefits of an improved school system. The exchange value in tax payments which society is willing to give to obtain the "intangible" values of the forest is the market value of these intangibles.

The economists' function is not to determine what this exchange value *should* be, but what it *is* or *will be*. The price of lumber can be estimated by economic analysis, but can be determined only in the market. Similarly the exchange value of public forest benefits can be estimated by appropriate economic analysis, but can be determined ultimately only by the decision of society expressed through its governmental apparatus. However, at many levels in decision-making the final value determination of the market place or the voter is not available. Decision is then necessarily based upon estimates of this exchange value. Under these circumstances it is the function of economic analysis to provide the best possible estimates.

The productive efforts which are required to produce social values have value in exchange as well as value in use. If the value in exchange to society of the benefits produced is not commensurate with the value in exchange devoted to their production, then society has been poorly served. The economist must look beyond the market place to estimate value in exchange, but in so looking he must not lose sight of his goal. The blades of supply and demand of Alfred Marshall's famous scissors work together in public as in private economies — and production, whether of timber, scenery, or game, is an economic function. It would be well if workers in forestry ceased rationalizing their economic difficulties and began solving them.

JOHN A. ZIVNUSKA,
School of Forestry,
University of California,
Berkeley.

Need for Watershed Management Action

I read Reed Bailey's article in the September 1950 JOURNAL with interest. It was a good statement of the importance of watershed management and influencing factors affecting such managing. Some of the needs in watershed management have been pointed out for years, in the Forest Service for 45 years, but strangely there has been great disinclination to mention the most important consideration in watershed management, namely the need for expenditure of money on the ground. For years, erosion gullies on the national forests have lengthened, widened, and deepened with no control of that process. No money has been made available.

A need of $100,000,000 for range improvements has existed for years with little money made available in spite of constantly increasing funds from Congress for administration of the national forests. These range improvements would go far in improving the vegetative cover which Reed Bailey's article emphasized as important in watershed management. For 45 years inspection reports have been written pointing out the need for money to promote good watershed management but instead of providing that money, larger office organization was built up. How long are the American people going to countenance the neglect of our valuable watersheds while favoring large organization and attempts to control forestry practices on private lands? If the writing of articles and inspection

reports would protect and rehabilitate our watersheds they would now be in perfect condition, but alas, such is not the case.

LYNN H. DOUGLAS,
Denver, Colo.

State Parks and Conservation

It was with much interest that I read the article on the purpose of state parks by Kermit McKeever.[1] Mr. McKeever makes a good plea for state parks, and described in interesting fashion some of the purposes of state parks. Having worked for a city park system for 8 years and having had training in development of parks, I am naturally very interested in state park systems. Nevertheless, I find that many times parks, whether national, state, or city, are not given the thought and care and attention which they need.

I could not quite agree with Mr. McKeever when he said that the reservation of the vast areas in the Yellowstone National Park was wise use. He said that "this was wise use; this was conservation." I am not so sure that it is wise use to allow many acres of lodgepole pine to rot, die, and blow down, thus creating a great fire hazard and leaving the area unsightly. A little later, he makes a remark that the setting aside of certain areas in West Virginia as a reserve is wise use. He adds that he thinks this is conservation. Not having seen the area and the extent, I cannot opinionate. I wonder whether this area is an ecological laboratory or a state park. One of the biggest difficulties we face today in the conservation movement is the lack of a proper distinction between the words "conservation" and "preservation." There are many people who feel that because they are "preserving" something, that they are also "conserving" something. This is not necessarily the case. They might be wasting resources flagrantly. To allow animals to overrun a wild area to the point where they destroy their food and thus themselves, is not wise use. This is often true in many park areas. A striking example of this was in Minnesota in Itasca State Park where the deer had multiplied to such an extent that they were totally destroying, not only their browse, but all the pine seedlings in the area. As the old pine, Norway and jack pine blew down, there was no seedlings to take their place. Finally, our courageous conservation commissioner committed sacrilege by opening up the park to hunting and many hundreds of deer were shot. This, of course, was protested strenuously but for the first time in many years, there are many pine seedlings beginning to make a showing in the area. At the same time, those hundreds of deer provided not only sport, but a great deal of food. If this had not happened, countless numbers of those deer would have starved to death. At the same time, the pine, which is the primary attraction in the park, would have been doomed.

It is almost impossible to practice pure preservation in the park areas. Nature does not do things that way. The balance of nature is a fine thing to talk about but we forget that as soon as man comes into an area, the balance of nature is upset. Therefore, man must take certain steps in order to see that preservation is mixed with certain conservation practices. Controls on fish life and game life, as well as on tree growth, must occasionally be imposed if the parks are going to be kept in an attractive state, free from fire hazards, and something worth drawing the people whom the park people wish to have visit their areas.

If ecologists wish to have a few acres here and there for study and research, let them practice "pure preservation" in these areas. I cannot agree that this is the purpose of parks. The primary purpose of parks, whether municipal, national, or state, is recreation. Not one person out of a hundred understands ecology, plant succession, etc. People enjoy well kept parks better than decadent ones. Let us not fool ourselves or the public.

Yes, let us have more and better state parks. Let's have beauty, trees, etc., but must every state park be an ecological research laboratory?

Some day the park administrators may awaken to find that most of the people are going to the state, national, and other forests because they prefer healthy forests to decadent stands and windfalls.

JOHN V. HOENE,
Duluth, Minn.

[1]McKeever, Kermit. Purpose of state parks. Jour. Forestry 48(10): 721. Oct. 1950.

Control of Heart-rot Fungi

Hepting and Roth in their article, "The Fruiting of Heart-rot Fungi on Felled Trees," (in the August 1950 JOURNAL OF FORESTRY), have shown that felling of conky trees reduces the dissemination of heart-rot fungus spores, but as control data on standing trees are not published, the exact ratio of conk production on standing and felled trees simultaneously cannot be established, and the suggestion of the authors for felling the attacked trees is questionable. During the last few years I observed that removal of the sporophores of such heart-rot fungi as *Fomes conchatus* (Pers.) Fr. *Fomes pini* (Thore) Lloyd, *Polyporus gilvus* (Schw.) Fr., etc., was equally effective in retarding the regeneration of conks on the standing trees, for I have not seen any conks regenerating on certain trees within the last three years after the original conks were knocked down. Indeed, the problem is far from having been solved and requires further investigation.

S. MURTAZA HUSSAIN, B.SC.,
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Pakistan Forest Research Institute,
Upper Topa, Murree Hills,
Pakistan.

Comment

Regarding Mr. Hussain's note on the fruiting of heart-rot fungi, I should like to mention that on standing trees in the United States, new sporophores regenerate readily when active sporophores are knocked off, in the case of many fungus species. Anyway, sporophores often occur too high on standing trees to be easily removed.

GEORGE H. HEPTING.

Newton Drury Leaves National Park Service

IN LATE January, Newton B. Drury, for over ten years director of the National Park Service, submitted his resignation to Secretary of the Interior, Oscar L. Chapman, to take effect April 1. As a result the Park Service has lost one of the most outstanding heads it has ever had.

It is well known now that this unfortunate event was not the result of a desire by Mr. Drury to give up his job. What happened was that he was offered an appointment as temporary assistant to the Secretary in charge of coordinating the activities of the several bureaus within the department having to do with management of federally-owned lands. Because these activities were not in line with his primary and lifetime interest, as well as because the salary was lower and the period of service limited, Mr. Drury decided that the wise thing to do was to end his connection with the department completely.

The loss of Mr. Drury comes at a time when he can ill be spared. The proposed use of the Dinosaur National Monument as a water storage and hydro-electric power development of the Bureau of Reclamation, with the approval of the Secretary of the Interior, hangs like a Sword of Damocles over the whole national park system. True to his duty and to national park standards, Mr. Drury opposed this project. In so doing he had the backing of all conservation organizations which take an interest in the preservation of our national parks. Full well we know that if this outstanding unit of the national park system is given over to economic development, it probably is only a question of time when others will fall to the same demand, and the disintegration of this outstanding and distinctively American contribution to human welfare will have begun.

It is fortunate that, by placing dams outside this national monument, but in the same general region, water impoundment and power production can equal those anticipated from the present plan, and thus meet all the requirements of the region; and the unchanged grandeur of Dinosaur National Monument will increasingly attract tourists. If all those who love the national parks will back this alternative plan vigorously,—with the Secretary, and if necessary with Congress and the President—the ideals for which Mr. Drury stood will yet prevail.

WILLIAM P. WHARTON,
President, National Parks Association.

Drury Honored by Conservation Groups

"You have deserved well of the Republic," declared representatives of eighteen national conservation organizations in a testimonial presented to Newton B. Drury, retiring director of the National Park Service, at a party in his honor at the Cosmos Club, Washington, D. C. on March 28. Mr. Drury, whose resignation was requested by Oscar L. Chapman, Secretary of the Interior, in a manner that aroused resentment among conservationists, has been appointed chief of the Division of Beaches and Parks of the State of California.

In signing the testimonial, representatives of these groups recorded their appreciation of Mr. Drury's distinguished services as Park Service director for more than ten years, and expressed "sincere regret that those services should now come to an end."

"You have been," the testimonial continues, "the chief custodian of our country's greatest treasures, unique and irreplaceable, the superlative works of nature upon our land and the monuments of the history of our people.

NEWTON B. DRURY

You have guarded these treasures with devotion and with courage as a sacred trust on behalf of countless generations to come, and you have known how to draw from them inspiration and enjoyment for the generations of the present. You have held high the ideals of a branch of the public service which has been notable for its ideals and its loyalty to them, and you have maintained and enhanced its great tradition."

Organizations represented at the gathering, and signing the scroll, were American Scenic and Historical Preservation Society, American Forestry Association, American Museum of Natural History, American Nature Association, American Planning and Civic Association, General Federation of Women's Clubs, Izaak Walton League of America, National Audubon Society, National Parks Association, National Wildlife Federation, Save - the - Redwoods League, Smithsonian Institution, Society of American Foresters, the Conservation Foundation, the Nature Conservancy, the Sierra Club, the Wilderness Society, and the Wildlife Management Institute.

Henry Clepper, executive secretary, and John D. Coffman, Fellow and former Council member, signed the scroll in behalf of the Society of American Foresters.

We Present

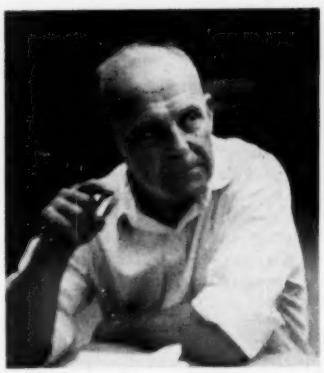
T. Edward Shaw

"His most noticeable and distinguishing characteristics are refreshing optimism and good humor." So wrote the anonymous, though discerning, author of a thumbnail sketch of T. Edward Shaw for the 1920 issue of *The Oak Leaf*, a student publication of the old Pennsylvania State Forest Academy at Mont Alto. From this institution, founded in 1903 and merged twenty-six years later with the Pennsylvania State College, Shaw was graduated in 1921 with the since discontinued degree of Bachelor of Forestry.

It is not unlikely that the dubious distinction of having been graduated from a school no longer in existence, with a degree equally obsolete, may have subsequently prompted him to work for a master's degree at Harvard. But, as is well known throughout the profession, Harvard also ceased in time to offer professional instruction in forestry and no longer awards the M.F. degree. Gifted to an unusual extent with a sensitive awareness of the wry, the droll, and the odd, Shaw is just the man to savor the novelty of possessing academic degrees, not from one, but from two defunct professional schools.

"I am convinced," wrote the Sage of Concord, "both by faith and experience, that to maintain one's self on this earth is not a hardship but a pastime, if we will live simply and wisely." Perhaps without ever consciously willing it to be so, Shaw's life has been patterned after Thoreau's dictum. Avoiding the inordinate ambitions that have hagridden many men to ulcers or worse, Shaw's career in forestry has been full but serene, quietly useful, and replete with those modest but satisfying professional rewards which accrue from years of service to an ideal.

During a career covering three decades he has successfully worked in three distinct though related specializations—state service, extension, and teaching. In these positions Shaw has demonstrated on innumerable occasions what is perhaps the most salient feature of his character—his natural talent for winning friends, an attribute which is all the more remarkable because it functions unconsciously and automatically. He is a rare individual indeed who, after ten minutes' exposure to Shaw's engaging personality, doesn't become and remain his friend. Today Shaw is one of the best known faculty "characters" of the Purdue campus, and unquestionably the best known forester in Indiana.



T. Edward Shaw

Another of Shaw's outstanding qualities is most accurately described by the words *personality adaptation*. Depending on his mood and the occasion, he can appear as stern as a chief justice, as benign as a bishop, as eloquent as a used-car salesman, and as farcical as an actor. His ability to "strike" contact with people, so to speak, made him an especially competent extension specialist. It has been reported by qualified observers that he could meet for the first time with a group of Hoosier farmers, all strangers and many of them skeptics, and within ten minutes they would be utterly at ease, laughing at his jokes, ready and eager to accept instruction in good woodland management.

When he is serious he is gravity personified; then his impressive countenance and his sonorous voice are calculated not only to command respectful attention but to inspire belief as well. The possessor of the orator's esteem for words, he has the ability to use speech as an organist manipulates a keyboard. He does not carelessly jumble words, but extracts the utmost in sensuous enjoyment from them, at the same time imparting to their pronunciation a rich and rolling resonance. The writer of this sketch has heard him recite nonsense verse and make it sound as impressive as a high-church curate intoning the litany.

As might be supposed, this gift is what makes Shaw such an able teacher. Once his dendrology students have heard him lecture on, say, *Liriodendron tulipifera*, emphasizing all the vowels, and enunciating the consonants with just the right syllabication, they are likely to leave the classroom with a proper sense of the importance of this excellent tree and with its name firmly fixed in their memories. By those qualified to judge such recondite matters, Shaw is reputed to be one of the best dendrology teachers in the business.

The subject of this sketch was born January 3, 1897 and christened Thomas Edward in Chester, Pa. He entered the old Pennsylvania State Forest Academy at Mont Alto in 1917, but dropped out to serve in the Navy as seaman 1/c during the First World War—the good one. Graduating from the academy with the class of 1921, he was assigned as assistant forester in one of the state forest districts of western Pennsylvania, where he spent the next two years building lookout towers and telephone lines, training fire wardens and their crews, and generally helping supervise the multitudinous activities of a state forest protection organization.

Though he was good at this field job, the milieu of the academician was more to his heart and talents. In 1923 he was appointed to the faculty at Mont Alto with the dual title of registrar and instructor. For the next five years he was occupied with the business administration of the school and taught various elementary forestry subjects as well. Then, aware of the need for graduate work as a basis for a sucessful career in education, he applied for leave of absence from the academy to enter Harvard for the master's degree in forestry.

A digression is in order at this point. It is a significant and revealing key to Shaw's personality that for several years thereafter, when mentioning his having attended Harvard, he would quite casually, and with a sort of deprecatory emphasis, use the word *matriculate*. To those who knew him well the inference was plain: whereas one simply registered or enrolled in an ordinary institution—a land-grant

college, for example — the act of becoming a student at so venerable and eminent a university as Harvard required a really high-toned verb to describe it; e.g., matriculate.

Returning to Pennsylvania in 1929, Shaw was prepared to settle down again to his teaching duties. But events decreed otherwise. In that year the Mont Alto school was merged with the Department of Forestry at Penn State. Assigned to a research position in the Pennsylvania Department of Forests and Waters, he undertook an administrative study of the commonwealth's fire tower system, later investigated weevil damage in white pine plantations.

During 1930 the Pennsylvania Department of Forests and Waters published his *Check List of the Woody Plants of the Mont Alto State Forest;* and his master's thesis, *Evolution of Forest Soils,* was published as Harvard Forest Bulletin 15.

The possessor of the imposing title of senior research forester and a technical author to boot, Shaw was observed to exhibit that indefinable professional manner which was then the hallmark of a forester with a master's degree—one, moreover, from Harvard —in an organization where the rest of the personnel could claim a bachelor's degree only, and considered themselves lucky to have that. In short, we realized that Shaw had gone up in the world, and among ourselves we freely speculated on how soon he would seek a broader field for his talents. It wasn't long. In May 1930 he departed for the Hoosier State, where he was named the first extension forester. Thus ended the Pennsylvania phase of his career, and the beginning of the Indiana period.

During the next twelve years Shaw developed a sound program of extension forestry in Indiana. In addition to the customary educational work and demonstration activities in farm woods management, he promoted tree windbreaks, erosion control projects, better wood utilization and timber marketing; and undertook cooperative work in land utilization with the Bureau of Agricultural Economics, and work projects with the Civilian Conservation Corps.

Because of his proved ability to cooperate effectively with people and organizations, he was asked in 1942 to serve also as acting state forester of Indiana as a temporary war measure since the State Division of Forestry had lost its top men to the armed forces. Thus in addition to holding down the job of extension forester, he administered the state forester's office, including 12 state forests (85,000 acres), 2,200 classified forests (125,000 acres), 3 nurseries, a state-wide forest protection system, and enforced the state's forestry laws.

Despite serious loss of manpower, with tact and diplomacy he was able to handle the job and keep up the standards of the Division. During his incumbency, he called a meeting of all the foresters in Indiana and with their help formulated a *State Plan of Forestry.* The loyalty of the state district foresters to Shaw was impressive; they looked to him not only as their boss but also as their counselor and friend.

But this was not all. On appointment by the Office of Civilian Defense, he became state coordinator of the Forest Fire Fighters Service. During the war period more than 6,000 forest fire fighters were trained under his supervision.

With the conclusion of hostilities, he relinquished the state forester's position and that of state coordinator, and concentrated on his duties as extension forester. During the fifteen years since he had first gone to Indiana, he was in almost constant travel status throughout the state, and he learned to know it—its hamlets, its woods, its roads, and its people—as few others do. In truth, his knowledge of Indiana, like Sam Weller's knowledge of London, is "extensive and peculiar." Thus it is no exaggeration to call him the best known forester in Indiana, and it is equally certain that he is the forester who knows Indiana best.

But while almost constant travel is broadening and educational, it is also tiring. Hence, when he was invited to join the teaching faculty of the Department of Forestry at Purdue, he accepted forthwith, and finally settled down.

Although he has been much too busy with his numerous educational, technical, and administrative duties to become a prolific writer, Shaw has nevertheless produced a respectable volume of news and magazine articles and radio items, mostly on farm forestry. Moreover, he is the author of a tree planting manual and a publication on forest protection published by the Indiana Department of Conservation, and of leaflets issued by Purdue University on phases of farm woods management and utilization. In addition he does an occasional stint of book reviewing for the JOURNAL OF FORESTRY.

One publication of which he is justifiably proud is *Fifty Trees of Indiana* written jointly with J. L. Van Camp. Printed cooperatively by the State Division of Forestry and Purdue University Department of Forestry, the book was issued to aid boys and girls in tree identification. A unique feature, developed by Shaw, is an identification chart; the reader is guided through the passageways of a labyrinth to the name of the tree in question.

As must be evident to anyone who has read thus far, Shaw has a well-developed sense of the histronic, and took to radio like a duck to water.

Purdue University's School of the Air consists of a series of daily programs broadcast from Station WBAA at Lafayette, Indiana and rebroadcast from six additional stations to an estimated audience of 200,000. One of the popular programs is "Your Indiana," a weekly favorite since 1947. The current subject matter for the program is the state's natural resources, and each broadcast offers a chapter about the historical development of Indiana in relation to one of its resources. Shaw is the story teller, a homespun character known as Uncle Ted, sometimes called the Old Forester, ably supported by a cast of student-actors.

This biographer was a visitor to the studio of Station WBAA last October when the program was "The Waters of Indiana." Against the muted background of Paul Dresser's immortal song, our avuncular professor described how the Wabash appeared before the advent of the white settlers, how this waterway influenced the development of the state's fur trade, its agriculture, and industry. "On the banks of the Wabash," he quoted, "has been nurtured the rare fusion of southern grace and Yankee industry which, for more than a century, has made the Hoosier one of the finest of American types." It was all very inspirational, very educational, and very well done.

Along with his radio work, Shaw is a talented amateur actor. He is a member of the Lafayette Little Theater group, and always has a lead part in the faculty plays. An able and witty toastmaster, he is in frequent demand to preside at large dinners and similar functions.

Shaw became a Junior Member of the Society of American Foresters in 1923 and a Member in 1933. Long active in professional affairs, he has served as secretary, vice chairman, and chairman of the Central States Section.

Like Homer's Ulysses, he is a man of many parts.

HENRY CLEPPER.

Reviews

Proceedings of the National Annual Meeting, Forest Products Research Society.

Volume IV. 512 pp. Illus. Forest Products Research Society, Madison, Wis. 1950. $8.

This book contains the 45 papers presented at the four-day 1950 national annual meeting of the Forest Products Research Society held at Portland, Oreg. The usual list of officers, committees, and members is included, as well as the business meeting proceedings.

The papers cover a wide field. They were presented under seven general headings as follows:

1.—Logs, sawmills, and lumbering. — Seven papers discuss quality of second-growth Douglas-fir, lumber grading problems, drying of redwood lumber, the action of saw teeth, research in lumber, and hardwood log grading.

Benson H. Paul of the Forest Products Laboratory in his paper on the "Quality of Second Growth Douglas Fir and Suggested Means of Improvement," points out that if quality timber is to be obtained in second-growth stands one must be careful to regulate growth rate by appropriate thinning operations. In essence, growth per acre means very little without consideration of the principal end product in view, be it saw timber, pulpwood, or simply the basic lignin-cellulose components of wood.

2.—Shipping containers, developments, problems.—The seven papers under this heading are probably of only limited interest to the forester. Package engineering is a booming field, and the papers presented give an excellent insight into some of the problems involved.

3.—Pulp and pulpwood supply developments.—Five papers have for their subject matter the economics of paper-making fibrous raw materials, utilization of low-grade hardwoods and softwoods in the Pacific Northwest, relation between wood and pulp properties, power *vs.* hand falling and bucking in the West, and improved methods of pulpwood handling.

George L. Drake of the Simpson Logging Company discusses the great improvements in utilization of low-grade hardwoods and softwoods in the Northwest, and the paramount role played by research in this development.

W. S. Bromley of American Pulpwood Association covers the subject of pulpwood handling by the use of loading docks, winches, trucks, conveyors, pallets, and various bundling systems.

4.—Quality control in forest products.—Most of the six papers under this heading are concerned with controlling product quality in plywood or furniture fields. Papers are presented on the detection of defects in wood by means of X ray and infra-red rays, and on the nondestructive testing of forest products by means of mechanical vibration.

5.—General topics.—One of the seven papers under this heading deals with wood-waste utilization in the Douglas-fir region, although nothing particularly new is presented. The remaining six papers are concerned with impregnation of wood with metals, gluing problems, wood preservatives, and similar subjects of little interest to foresters.

6. — *Wood particle board.* — Eight authors presented papers concerning the manufacture of boards from wood waste. More and better synthetic boards are being produced and developed each day, and it is well for the forester to be familiar with this trend because of its increasing effect on his own or his colleagues' livelihood.

7.—Softwood plywood review.— Six papers are presented under this heading. In the main, they are concerned with manufacturing problems, markets, and trends in the industry.

The volume is valuable to the forester as an excellent reference for specific technical and semi-technical utilization problems, and for casual reading in order to keep abreast of developments in the industry as a whole.

ROBERT B. BLUMENSTEIN,
Timber Engineering Company.

Indian Forest and Range (A History of the Administration and Conservation of the Redman's Heritage).

By J. P. Kinney, 357 pp.+ix. Illus. Forestry Enterprises, 1740 K Street, N.W., Washington 6, D. C. $4.50.

The first three chapters of this book briefly sketch the development of lumbering operations on Indian lands as a means of satisfying the urgent needs of the Indians for subsistence and for the ordinary comforts of life. The official documents quoted tend to refute completely the sly suggestions or confident assertions, heretofore made, attributing the inauguration of such operations to connivance between unscrupulous lumbermen and government officials who were alleged to have been unfaithful to their obligations as guardians of the Indians' property. Successive commissioners of Indian Affairs, superintendents, and minor officials appear to have been sincerely interested in the welfare of the Indians and eager to use their physical resources to advance the civilization and economic status of the natives. Often the attitude of the Indians themselves was the chief deterrent to progress. Conceding the inappropriateness of some of the practices followed in the disposal of timber, the author notes the administrative difficulties inherent in an effort to control the affairs of large groups of people who possessed a very slight sense of civic responsibility —who had only a faint realization of the importance of thrift in a social economy based upon the creation of wealth through personal ef-

fort, which the government desired to sustitute for a primitive mode of life.

The fourth chapter discloses the impact of the rising tide of forest conservation upon lumbering operations on Chippewa lands in Wisconsin and Minnesota. The enthusiasm of young foresters resulted in restrictions upon logging methods which substantially reduced the income to which the Indians thought themselves entitled, and after a short trial of their silvicultural prescription, the members of the Forest Service in the Department of Agriculture completely abandoned their group seed-tree method of silviculture.

Looking back forty years, the author seems to feel that crude silvicultural regulations were formulated by inexperienced technicians and then, when success did not immediately follow application, the regulations were too readily jettisoned. In extenuation of the abandonment of these early provisions for the reservation of a part of the original stand in small groups of trees, it may be observed that forty years later few advocates could probably be found for the plan that failed in 1908, and it may be pointed out that not until two decades after 1908 was there any serious application, in commercial operations, of methods of selection logging in the mixed stands of hemlock, pine, and hardwoods in the Lake States. Not only was silvicultural knowledge lacking in 1908—economic conditions were decidedly unfavorable to the practice of forestry in Wisconsin during the first quarter of the twentieth century.

Chapter V presents a brief statement of the travail incident to the birth of the Forestry Branch of the Indian Service, in which the intimate relationship of the author to the Conservation Movement is clearly revealed. Many disclosures made here, throwing light upon events during a particularly interesting period in the history of forestry in America, could have been made only by the author. Foresters who have come upon the stage during the last thirty-five years have known little of the far-reaching effects of the Ballinger-Pinchot controversy in the administration of President William H. Taft.

Chapters VI to X, inclusive, are compendiums of information as to prices received for stumpage on more than thirty Indian reservations over a period of a quarter of a century. It is believed that nowhere else can be found, in a single volume, such detailed information on prices actually paid for stumpage, together with pertinent remarks as to business conditions, the character of the timber, and sale provisions and methods. Since all Indian contracts of that time required payment on the basis of actual scale by the Scribner Decimal C Rule, the prices recorded need no correction because of faulty estimates of volume. The prices are not those at which lumbermen carried stumpage on their books for accounting purposes, but are the actual prices they were willing to pay for standing timber. These data will be of special value to silviculturists, forest economists, and timber sale administrators.

Chapter VII is devoted entirely to the Menominee Reservation in Wisconsin. This special attention is merited—the first commercial lumbering operation on land controlled by the United States was authorized at Menominee by Congress in an act of March 28, 1908. This act contemplated conservative forestry practice, but for two decades destructive forest fires, adverse market conditions, and the probability of allotment of the Menominee lands to the Indians for homestead purposes resulted in the practice of removing practically all the commercially mature timber from the areas being logged. Generally speaking, this appears to have represented the considered judgment of both the Department of Agriculture and the Department of the Interior as the right practice to be followed under the existing conditions. A narrow construction of the terms of the act as to the meaning of the phrase "fully matured and ripened green timber" with respect to logging practice was considered inconsistent with economic solvency before the advent of motor truck logging. The author was not always in agreement with other foresters as to the interpretation to be placed upon the terms of the act of 1908.

The last three chapters of Part I contain much information that can be found in no other place in forestry literature—circumstances and occurrences concerning which Mr. Kinney is probably the only living forester having personal knowledge. Many of the statements afford the forestry profession entirely new vistas of the formative period of forest and range conservation. These three chapters and Chapter V, dealing with subject matter that was at one time more or less controversial, will prove of special interest to historians, general economists, those charged with the formulation of federal land policies, and others who may not find sustained interest in the chapters that recite in great detail prices and other data.

Part II, consisting of four short chapters, covers succinctly but adequately the record of timber sales from Indian lands during the period 1933 to 1950, with a discussion of the steps taken by foresters in the Indian Service to insure full protection of the Indians' interests. Summaries of the results attained at three commercial mills are presented.

The author was so closely associated with practically all the events and circumstances delineated in the first thirteen chapters that this review cannot be concluded without some reference to the spirit in which the task of preparing the record was apparently performed. It is evident that one primary purpose was the perpetuation in printed form of historical transactions, in which the author had taken an essential part, the significance of which would not be apparent to later foresters without the benefit of his explanations. The author has not hesitated to express criticism of public policies or of the action of individuals, but this has been done in a spirit of fairness and freedom from personal bias.

Entertaining firm convictions and stoutly refusing to compromise on principles, Mr. Kinney found it necessary to accommodate his views to those of associates and superiors on numerous occasions and apparently he harbors no ill-will toward those whom he believed to be sincere in their opposition to projects which he favored. The spirit of *Indian Forest and Range* is commendable. It will fill a unique place in any forester's library.

A. Z. NELSON,
Forest Consultant,
New Ipswich, N. H.

Applied Silviculture in the United States.

By R. H. Westveld. 590 pp. Illus. John Wiley & Sons, Inc., New York, 1949. $6.

Applied Silviculture in the United States, first (lithoprinted) published in 1935, represented the first compilation of regional silvicultural information and was designed as a textbook. Later, Westveld revised the original issue and it was published by John Wiley & Sons in 1939. The present revision (1949) represents his most recent summary of regional silvicultural practices in the United States.

In undertaking this revision Westveld's objective was "to include the advances in silviculture in the past 10 years. This has necessitated a few fundamental changes. The most important of these is concerned with the handling of data on prices, costs, profits. . . . Most of the monetary values have therefore been deleted."

However, the reviewer has noted that there are at least twelve places in the book where monetary values are still given. For example, the tables on pages 396-397 should have been either changed or deleted; on page 207 naval stores returns are given for the year 1929; on page 62 white pine blister rust control costs are given for 1930.

The second edition contains the same number of chapters as the first, and the same eighteen regional divisions are used. Some changes in the use of bold-face type make the chapter and paragraph headings much easier to follow. The new edition contains 23 more pages than the old edition. There are no major changes that can be noted in any of the eighteen chapters. Only the changes in the text material have been made in order to bring into the discussion the newer information.

A few of the shortcomings of the book are indicated in the following comments.

Although the Wiley bulletin states that "many of the photographs have been replaced" actually only 18 new photographs have been used out of a total of 102. Many of the photographs used in the new edition were also used in the 1935 publication and in the 1939 edition. New illustrations would certainly have improved the text. American chestnut is not too important silviculturally and a more recent picture of tip-moth injury might have been included. The silvicultural importance of the bear oak type hardly warrants the inclusion of figure 20 (page 112). Since the book is intended for student classes it seems to the reviewer that photographs should be very carefully chosen and be illustrative of the text material.

It is realized that parts of the book can be selected for critical comment since some parts have not been revised. However, one cannot overlook a statement like that on page 100 concerning deer damage, "the use of repellents shows promise but is not adequately developed." To date no known deer repellents have been reported. Another statement on page 363 is out-of-date and its revision was apparently overlooked by the author, "there were in 1930, 26 pulpwood mills in the region" (Douglas-fir region). It is examples like those given that make it necessary to explain to students who use the book that it is slightly in error and out-of-date. But exceptions given are few compared to the volume of information that the book contains.

Altogether 270 new literature references have been added, bringing the total up to 852. The 585 references from the first edition have been retained in the new edition. Although some silvicultural reference material must not be available to the author, Wahlenberg's book *Longleaf Pine* should have been included in the reference list for the southern pine region. Then, too, the 1942 publication *The Rainbow Forest Plantation* by H. W. Hickock was omitted from the oak region reference list (page 118).

Silviculturists, especially instructors in silvicultural courses, will read this new book and find a few out-of-date statements. Fortunately these errors will be more than offset by the newer text material that has been added. The first edition was used as a text in regional silvicultural courses and the author should be complimented on making the second edition available for similar use. Practicing field foresters will find in this book much useful silvicultural information.

DANIEL DENUYL,
Purdue University.

Southwestern Trees.

By Elbert L. Little, Jr. 109 pp. Illus. Agriculture Handbook No. 9. Superintendent of Documents, Washington 25, D. C. 1950. 30 cents.

Subtitled *A Guide to the Native Species of New Mexico and Arizona*, this manual presents nontechnical descriptions and drawings of 135 species of trees classified in 60 genera and 32 plant families. Families with the greatest number of species represented are the pine (18 species) and willow (17 species).

The Southwest is a fascinating region for the plant ecologist and botanist. Twelve principal vegetation types are recognized by this bulletin in the two states, descending from Alpine tundra above timber line (11,500 feet plus) to the desert type of the plains and valleys including the bottom of the Grand Canyon.

To the tourist the Southwest often appears to be a land more characterized by desert cacti, sagebrush, and mesquite, rather than by commercial forests. Yet one-fourth the area of these two large states is in woodland. Four coniferous species account for 98 percent of the sawtimber, of which

ponderosa pine makes up 82 percent and Douglas-fir 10 percent, with white fir and Engelmann spruce comprising the remainder.

A welcome addition to tree literature, this handbook fills a long-standing need for a guide to southwestern trees. The drawings are extremely well done and should be a great aid in identifying the species, particularly the yuccas and the cacti. But it is a pity these drawings were not reproduced in larger size; detail and minute differences are lost in some species, such as the willows, because of the smallness of the illustrations.

The handbook, a great bargain at 30 cents, was prepared in the Forest Service, U. S. Department of Agriculture. The author is a well-known dendrologist.

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Principles of Silviculture.

By Frederick S. Baker. 414 pp. Illus. McGraw-Hill Book Co., New York. 1950. $5.

To yank a single sentence from context sometimes places both author and reviewer in precarious spots. However, Frederick S. Baker's assertion that, "Forestry must be sound both biologically and economically if it is really to work," seems to state well the philosophy of the author as exemplified in *Principles of Silviculture*, and there is little doubt as to the veracity of the statement. However, one or the other of the conditions has too frequently been forgotten by practicing foresters.

Principles of Silviculture, although designed primarily as a textbook for use by forestry students, might also serve to bring back to earth—literally—any foresters who have tried to ignore the basic biologic facts of tree growth. For this is essentially a book on silvics, rather than silviculture. It is an outgrowth of the first half of Baker's *Theory and Practice of Silviculture* (1934), and does not cover the applications of silviculture.

It is most refreshing to follow the author's candid presentation of "the forest as a static affair (what it is) and then the natural laws of its development (how it works)." He doesn't mind telling all viewpoints of problems still not completely solved. If the answer is not known, he says as much. If certain research seems to be getting at the root of the matter, he calls attention to it.

The book is grouped into three parts. The first deals with the form and composition of forests and with the ecological, site quality, tolerance, and crown classes of forests. The next several chapters are devoted to physiological reactions of trees to water and nutrients, and to the photosynthetic process. The remainder of the book records the essence of current knowledge of seed production, dissemination, and germination and of the growth of trees and stands.

The bibliography for *Principles of Silviculture* consists of 519 listings, of which over 100 refer to articles or committee reports in publications of the Society of American Foresters.

The many tabulations, graphs, and diagrams are valuable in portraying the multitude of facts presented in this volume.

After studying this book, no one could doubt that forestry is a science, nor could he doubt that he was then better prepared to practice forestry.

ROBERT D. HOSTETTER,
Society of American Foresters.

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Possibilities of Increasing the Use of Tropical Timber.

Published by the "Organization for European Economic Co-operation." 95 pp. Illus. Columbia University Press, New York. 1950. $1.50.

This report by a group of 17 economic experts in six western European nations, members of the "Organization for European Economic Co-operation," is an attempt "to alleviate the uncertainty with regard to future supplies of timber" by increasing importations of tropical wood. Eighteen nations are members of O.E.C.C. The United States and Canada, though not members, participate in its work.

In order to increase the production of tropical timber for European consumption, the experts predict that a long-range program for the development, mechanization, and financing of tropical forests must be undertaken. "The creation of good forestry condition" is advocated though the methods to be followed are not explained.

The overseas possessions of five of the member nations (Belgium, France, Netherlands, Portugal, and United Kingdom) include a "dense forest area" of some 800 million acres. Apparently, the export possibilities are unlimited, granted adequate finances and organization.

A feature of this report is a list of tropical timber species, classified by regions of origin and kind of utilization.

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A Natural History of Trees of Eastern and Central North America.

By Donald Culross Peattie. Illustrated by Paul Landacre. 606 pages. Houghton Mifflin Co., Boston. 1950. $5.

This lively and interesting book, which tells about the native trees of central and eastern North America, includes those of the southern Appalachians and some which are indigenous to the deep South but with ranges extending northward along the Atlantic Coast and up the Mississippi Valley. Twenty-one conifers and 141 broadleaved species are described, some of the latter being large shrubs which occasionally attain small tree size. A general key and twelve generic keys are presented, based mainly upon foliage.

Just what the title indicates it to be, a popular book on trees, it is not written for the professional forester or botanist, but rather for the great mass of people who like trees enough to want to know more about them. The present reviewer believes, however, that many professionals would enjoy it. He found it so easy to read that he covered nearly a hundred pages before remembering that he was supposed to be doing a critique.

The writing style is often vivid.

Here is an example: "An icy rain was falling—a rain that presently turned to blinding snow—and the roaring creeks of Tennessee were rising fast on the last day of February, 1796, when Andre Michaux stopped his horse, somewhere in the lonely woods twelve miles from Fort Blount, to examine a curious tree. True, the leaves must have been off it then; it stood winter-naked, but with its smooth silvery gray bark shining like some wood nymph through the drear forest. With his experienced plantsman's eye, this wandering Frenchman . . . now added to his long list of first discoveries of American tree species what is one of the rarest trees of eastern North America. For the Yellowwood has a most restricted range, and even within the described limits of that range is often a distinctly rare tree."

When your reviewer read this passage, it recreated in his mind his own first discovery of yellowwood in a deep forested ravine in Brown County, Indiana. And it will probably recall to many readers' minds their own first discovery of some tree.

In his foreword the author says, "Almost every tree in our sylva has made history or witnessed it, or entered into our folkways, or usefully become a part of our daily life. To tell a little of these things is the main purpose of this book." This he proceeds to do in a most entertaining manner. So the book is more than a series of systematic descriptions of tree anatomy, distribution, and habitat, with some added silvical information; in it the trees march through the pages of American history.

An account is given of the utilization of tree fruits, bark, and wood by Hernando DeSoto's expedition in the Mississippi Valley in 1541, and to the use of eastern red cedar for construction purposes by the Roanoke Island colonists in 1564. Another interesting passage tells of the medicinal virtues claimed for sassafras by Nicholas Monardes, an early Spanish explorer, in 1574. From these beginnings, on down through the centuries, runs the story of man and the trees of eastern North America, of the fleets built, of the homes and barns constructed, of the wood-using industries developed, and of the many other countless services of trees to man.

It should be apparent by this time that your reviewer has developed a predilection for this book. This is admitted on a number of counts. Here is an author who casts no slurs on the excellence of sassafras tea (which your reviewer happens to like); who considers water-witching "one of the most harmless and pleasing of fallacies;" and who has a good word to say for persimmon pudding. He also has the courage to refer to Shumard red oak as a botanist's species (which it is); and he has kinds things to say about Virginia pine, a tree which grows well on our gullied lands and hides our mistakes.

The author doesn't overlook the fauna while writing of the sylva. In his description of the fruiting habits of persimmons, he points out that some trees ripen their fruits in late summer, some in the fall, and some in winter, with the result that the persimmon is an almost "ever normal granary" for many wild creatures. In his comment on the prickly ash (Zanthoxylum), he tells how the caterpillar known in the south as the orange dog, which injures young citrus trees, has been spreading north and west in the prickly ash and the hoptree (Ptelea).

Through the book runs a plea for a recognition and appreciation of trees values and for the conservation of these values. Your reviewer believes that the book is a notable contribution to conservation education, and commends it to the attention of people teaching in this field.

The sources of information used in the book are of high caliber, including such works as *The Flora of Indiana* by Charles C. Deam. Some of the historical references are entirely new to your reviewer, who found them extremely interesting. The virile illustrations by Paul Landacre are faithful and are valuable supplements to the word descriptions of the trees. One interesting and helpful feature is the fact that both the index and scientific names and that of English common names include synonyms. The reader who uses the index will end up at the same place whether he calls the tree black gum or pepperidge, *Nyssa sylvatica* or *Nyssa biflora*.

Your reviewer found a few errors and omissions. This is understandable in a volume of 600 pages devoted to 162 species whose ranges cover thousands of square miles and with historical records extending through four centuries. But these criticisms would be so picayunish in the light of the book's general worth, particularly in its fulfillment of its purpose, that your reviewer is inclined to avoid mentioning them.

T. E. SHAW,
Purdue University.

The Charles Lathrop Pack Demonstration Forest.

By Clifford H. Foster and Burt P. Kirkland. 36 pp. Illus. Pack Forestry Foundation, Washington 6, D. C. 1949.

The Pack Demonstration Forest located in Warren County, New York, was conveyed to Syracuse University in 1927 for the use of the New York State College of Forestry. In the bulletin under review the authors have presented the story of the organization, administration, and management of this forest for the first twenty years.

A few pages are devoted to the acquisition of the lands, the early history of land use, and the initially established policies for the forest's operation. Then follow detailed discussions of land classification, techniques of management, problems encountered, and results obtained.

The Pack Forest covers 2,211 acres. Of this area, 1,868 acres are classified as merchantable working forest, including 335 acres of reforested land, and it is to these lands that the major efforts of development and management have been devoted. The additional 343 acres include nonforest lands and areas reserved for special uses, in-

cluding ecological studies, research, and camp sites.

The main points of management deal with the techniques of highly specialized silviculture as they apply to the establishment and care of forest plantations, and to the treatment of the natural white pine, hemlock, and hardwood types. In addition, and highly important, are the utilization activities which were found essential to make possible the practice of intensive silviculture.

The natural hardwoods presented unusual difficulties. Estimates showed that only 16 percent of all hardwood trees over 7 inches d.b.h. were good prospective sawlog trees. The statement is made that new industrial developments for the economic utilization of such hardwoods are essential if these hardwood stands are to be successfully managed. Those who have worked with similar inferior stands will agree fully.

Because much of the timber was inferior in quality in accordance with current utilization standards, an early decision was reached to install a mill with accessory equipment so that logs could be cut into short lengths and made into specialized products for profitable sale. This phase of work has been highly successful. The integration of the utilization and silvicultural activities is an important concept and one which is well developed in this bulletin.

Finances are discussed at length but space is not available in this brief review to analyze the figures presented. Suffice it to say that where financial support has come from both state and private sources, and where an appreciable contribution was made as the result of a C.C.C. camp, federally supported, the breakdown and analysis of amounts to be credited to forest management, research, recreation, and public education become extremely complicated.

The authors have presented an interesting and informative publication, one which will be valuable not only in carrying out the intentions of the donor, but increasingly useful for reference as the years pass.

An excellent map is presented as well as numerous illustrations of high quality.

C. H. GUISE,
Cornell University.

The First Half-Century of the Yale School of Forestry.

Edited by S. N. Spring. 211 pp. Illus. Yale University School of Forestry, New Haven, Conn. 1950.

Prepared in commemoration of the semicentennial reunion of the Yale School of Forestry faculty and alumni, held at New Haven on December 11 and 12, 1950, this publication offers an interesting, historical account of the founding and development of what is unquestionably one of the world's foremost educational institutions in forestry. In the United States, the early growth of forestry education at Yale profoundly influenced the evolution of the forestry profession to a degree which those who have entered the profession during recent years can scarcely comprehend.

The story of the first decade of the school was written by the late Henry S. Graves. It is a fascinating chapter. One is impressed less by the educational pioneering of that era, important as that phase of the school's development undoubtedly was, than by the tremendous financial difficulties met and overcome through the generosity of the Pinchot family and others.

Dean Garratt has written the second chapter, the account of the school during the period 1910-1950. It is evident that several favorable circumstances have contributed to the success of the school, especially during the formative years. One of these circumstances was the planned program of instruction based on the graduate (M.F.) degree. Another was the excellence of the faculty. And a third was the generally high level of student attracted by the institution.

Additional chapters have to do with alumni relations of various kinds: the alumni in professional education; the alumni in federal forestry, state forestry, and private forestry; and the influence of the alumni in foreign countries. An appendix gives a roster of all those who taught in the school since its inception, a list of publications issued by the school, a list of technical publications by faculty and alumni, and a record of Yale foresters in the armed services during two wars.

While possibly not intended for general distribution, this publication will be informative both to the forester interested in education and to the forester interested in the history of his profession. In reading it, one cannot help but be impressed by the high ideals, the hard labor, and the intense confidence of Mr. Graves, his supporters, and associates. Here were men who conceived the need for this school and who persisted against numerous obstacles in creating it out of their intense enthusiasm and belief in a profession which up to that time had no existence in America.

Our profession owes much to this school. For forestry, as for the arts and sciences in general, Yale has in truth offered, in the words on its official shied, *Lux et Veritas.*

HENRY CLEPPER.

Deciduous Forests of Eastern North America.

By E. Lucy Braun. xiv + 596 pp. Illus., with folding map. Blakiston Company, Philadelphia and Toronto. 1950. $10.

The hardwood forest of eastern North America is probably the most complex assemblage of plants to be found outside the tropics. To the plant geographer its description and causal explanation are fully as baffling as its management is to the forester. Dr. Braun, professor emeritus of plant ecology at the University of Cincinnati, has devoted most of her career to the study of this forest. Her investigations have been sufficiently keen and energetic to establish her reputation as the outstanding authority on the subject. This monograph represents the fruit of a lifetime of endeavour.

The purpose of the book is to portray the original deciduous forest and to trace the present pattern of distribution through geologic time. Dr. Braun sought out the fast-disappearing remnants of virgin timber in her efforts to reconstruct a picture of the original forest. She presents no less than 91 tables of species distribution in stands representative of the late successional stages in old-growth timber throughout the region. The importance of this contribution cannot be underestimated because many of the stands involved no longer exist. The impact of man's influence on the eastern deciduous forest is indicated by the fact that the existing secondary forests often bear only a vague resemblance to the original ones with which she is almost exclusively concerned.

Foresters will find her description and classification of the regional distribution of original forest types of most immediate interest and greatest value. She regards the complex "mixed mesophytic association" prevalent on the Cumberland and Allegheny Mountains, as well as on the adjacent plateaus of the same names, as the most highly developed segment of the deciduous forest. She states that this forest is "the lineal descendant of the mixed Tertiary forest" from which the less complex types of the remainder of the deciduous forest have been derived. She believes that the prevalence of the mixed mesophytic association west of the main Appalachian Mountain system is due not only to favorable climate and soils but to the persistence of fairly rugged terrain in that section during the formation of the Schooley peneplain of the Oligocene. Her mixed mesophytic association contains virtually all of the species found in the deciduous forest. It is interesting to note that sugar maple and beech, often regarded as typically northern species are commonly predominant in this association. The best indicator species, however, are sweet buckeye and white basswood (*Tilia heterophylla*, not the *Tilia americana* of the northern glaciated regions).

The surrounding forest regions have generally been named from the late successional associations most prominent in them. These associations contain fewer species than the mixed mesophytic association and the predominant species are better adapted to the less favorable environmental conditions of these regions. The mixed mesophytic association may occasionally be found on good sites outside the Mixed Mesophytic Forest Region itself. This association is, for example, well represented in the "cove-types" of the Oak-Chestnut Region which lies immediately to the east, stretching from southern New England to the Southern Appalachians.

The Western Mesophytic Forest Region adjoins the Mixed Mesophytic Forest on the west, covering western Kentucky and Tennessee as well as parts of adjacent states. It is characterized by "a mosaic of unlike climaxes" induced by local variations in climate and soils. Dr. Braun's Oak-Hickory Region extends from the southern shores of Lake Michigan to Texas and along the eastern fringes of the grasslands. The oak-hickory association, although best typified by the forests of the Ozarks, also occurs in the broader valleys of the eastern Oak-Chestnut Region.

The Oak-Pine Region of the northern Coastal Plain and the Piedmont is a transitional region of oak and oak-hickory climaxes; it has been so named because of the prevalence of subclimax loblolly and shortleaf pine in intimate association with the hardwoods. The Southeastern Evergreen Forest Region occupies the Coastal Plain from Virginia southward and includes the alluvial plain of the lower Mississippi River; the soils of most of this area, however, are not favorable to the development of late successional broad-leaved forests. The region is transitional with the broad-leaved evergreen forests further south and represents the fringe of the deciduous forest.

Dr. Braun states that the soils and topography of the glaciated regions are too immature to permit maximum development of the deciduous forest. She also believes that climatic changes since deglaciation have been more pronounced in the glaciated than in the non-glaciated regions and have also prevented establishment of vegetational equilibrium. The Beech-Maple Region of northern Ohio, southern Michigan, northern Indiana, southern Ontario, and western New York is regarded as the result of migration of vegetation from the unglaciated Mixed Mesophytic Forest Region lying to the southeast. The Maple-Basswood Region of southwestern Wisconsin and central Minnesota is believed to be the result of maintenance of the maple-basswood association in the unglaciated Driftless Area of Wisconsin and westward migration therefrom. The Hemlock - White Pine - Northern Hardwoods Region, which extends from northern Minnesota across the northern part of the Great Lakes Region to New England and the Maritime Provinces, is a mosaic of deciduous and coniferous communities resulting from postglacial migrations out of the unglaciated parts of the Allegheny Plateau and the northern Allegheny Mountains.

The late successional forest associations within these regions are described in considerable detail and illustrated with fine photographs. The limits of the regions recognized by the author are shown on a large-scale folding map which comes with the book.

The book is a stimulating one which is bound to arouse controversy among ecologists, plant geographers, and foresters. There is not likely to be major disagreement over the masterly analysis of the distribution of original forest types, but the question of development of that distribution will produce as many interpretations as interpreters. Dr. Braun has placed great stress on the importance of geologic processes involving millions of years in molding the development of the forests of the unglaciated regions. It is her contention that the forests of these regions have remained exceedingly stable. Although she has marshalled her evidence well there are many who will prefer to

believe that conditions of soil and climate prevailing in more recent times determine the present distribution of forest types. It is possible that climatic changes during the Pleistocene may have induced significant changes in conditions in unglaciated regions and that forest communities are capable of relatively rapid response to these changes. However, as the author shows, the present evidence is inadequate to settle the matter.

DAVID M. SMITH,
Yale University.

The Management of Bottomland Hardwoods.

By John A. Putnam. 60 pp. Southern Forest Experiment Station, New Orleans, La. 1951.

Issued as Occasional Paper 116, this multilithed bulletin is the first comprehensive publication on the management of bottomland hardwoods. Although the greatest area of these hardwood types is found in the Mississippi Delta, all southern states have some bottomland hardwood acreage. In fact, more than 30,000,000 acres, about 20 percent of the South's total forest area, are in bottomland types. Although this great resource is the basis for the enormously important hardwood industry of the South, little research, as compared with other extensive timbered areas, has been carried on.

As a guide to the management of these lands, this bulletin is both timely and significant. Written for the land manager who must build up depleted stands and at the same time supply a mill with timber or provide an income for the landowner, the bulletin provides basic information needed to get management started.

Under management, the author believes this land will grow 500 board feet per acre per year, plus two-thirds of a cord of topwood and thinnings. A major obstacle to the practice of forestry is the large volume of low-grade hardwoods for which markets are lacking and which must be cut and utilized before maximum production of good species can be obtained.

For readers unfamiliar with the bottomlands, Mr. Putnam, who is a recognized authority on his subject, describes the important types, the effect of site on type, and the influence of hardwood utilization practices upon forest management. A final chapter treats conventional management techniques such as cruises, growth estimates, management plans, and other devices not needed in the first managed cut. The appendix summarizes the chief uses and silvical characteristics of the important bottomland species.

Management of Ponderosa Pine in the Southwest.

By G. A. Pearson. 218 pp. Illus. Agriculture Monograph No. 6, Forest Service, U. S. Department of Agriculture. Superintendent of Documents, Washington, D. C. 1950. Fifty cents.

In reviewing Gus Pearson's last bulletin, one has a strong urge to be his biographer. Even the formal government style does not hide too well the forceful and positive nature of the author. In writing the present text Pearson had before him his 27 major articles listed in the cited literature, as well as thousands of reports, memoranda, and letters. With these numerous writings he vitalized the forestry scene of the Southwest for many years. He took on the hazardous business of generalizing on forestry and grazing subjects and often came head on to near violent reaction. This may have given him the incentive to drive on for the forestry facts that he discovered without benefit of elaborate equipment or even comfortable living conditions. His interest in forestry never slackened even on retirement but kept on growing and sometimes became almost obsessive. He had a true researcher's enthusiasm for detail as readers of this monograph will discover.

The present volume was written by Pearson after retirement from the Southwestern Forest and Range Experiment Station. To him and all who knew him it represents his life's work. Among other things, this book gives results and more or less personal views on ponderosa pine management over the past forty years. It gives a critical review of many forestry practices and points out the vital factors concerned in the reproduction of ponderosa pine in the Southwest. He stresses the fact that ponderosa pine forests need repeated treatments if they are to be put into a high state of production and that one harvest cutting properly done may be helpful in this but is seldom a complete measure.

Foresters will find the findings of Pearson's studies of much value for use in other sections besides the Southwest. They will need, however, to watch certain generalizations by Pearson, who had very little intimate acquaintance with ponderosa pine stands in other sections of the 12-state western pine region. Most debatable statements are in the early and some of the final chapters of the book. These cover forestry subjects on which the author did not especially concentrate his research work. They were added apparently to give full coverage to the subject. They do not add to the strength of this outstanding publication on the management of ponderosa pine. His silvicultural findings are particularly deserving of high recognition.

This last book by Pearson will be widely read with pleasure and profit by foresters everywhere. It will be the foresters bible in many parts of the West.

ERNEST L. KOLBE,
Western Pine Association.

Current Literature

Compiled by MARTHA MEELIG, *Librarian, The New York State College of Forestry*

Range Management Section Compiled by FRANCES FLICK, *Library, U. S. Department of Agriculture*

General

America's Strength Grows in Her Forests. 8 pp. Illus. American Forest Products Industries, Inc., Washington 6, D. C. 1951.

The British Islands and Their Vegetation. By A. G. Tansley. 970 pp. Illus. Stobart & Son, Ltd., London S. W. 1. 1950. 64s-0d.

Future Forests; Forestry for 4-H Club Boys and Girls. By F. E. Winch, Jr. 28 pp. Illus. New York State College of Agriculture, Ithaca, Cornell 4-H Club Bul. No. 90. 1950.

Pennsylvania Agriculture and Country Life, 1640-1840. By S. W. Fletcher. 605 pp. Pennsylvania Historical and Museum Commission, Harrisburg. 1950. $3.00.

What Every Forest Officer Should Know; rev. ed. By R. W. Ayres and W. I. Hutchinson. 15 pp. Illus. U. S. Forest Serv., California Region, San Francisco. 1950.

Farm Forestry

Forestry Handbook for the Upper Mississippi Region; 5th ed. 101 pp. Illus. 1950. 45 cents (Govt. Print. Off.)

Forest Management

Chemical Control of Brush and Tree Growth for the Lake States. By P. O. Rudolf. 30 pp. Lake States Forest Expt. Sta., St. Paul, Minn. 1951. Misc. Rept. No. 15. Mimeog.

Cost of Selective Marking for Pulpwood. By A. G. Randall. 2 pp. Univ. of Maine Dept. of Forestry, Orono. Tech. Note No. 5. 1950.

A New Era of Forest Management. By V. E. Johnson. 23 pp. Illus. Canadian International Paper Co., Montreal. 1951. From an address before the International Circulation Managers' Ass'n., June 13, 1950.

A Preliminary Investigation of the Conformity of Girard Form Class Volume Tables to Various Species in Maine. By V. Ricker. 1 p. Univ. of Maine Dept. of Forestry, Orono. Tech. Note No. 1. 1950.

The Problem of Second Growth in its Relation to Sustained Yield. By H. H. Chapman. 13 pp. Univ. of British Columbia, Vancouver. An H. R. MacMillan Lectureship Address. . . Feb. 1951.

Pulpwood Marking Rules. By A. G. Randall. 2 pp. Univ. of Maine Dept. of Forestry, Orono. Tech. Note No. 4. 1950.

Forest Resources

Forest Statistics for New Hampshire. 56 pp. Northeastern Forest Expt. Sta., Upper Darby, Pa. Forest Surv. Release No. 9. Mimeog. 1950.

A National Policy for Timber Lands. By E. L. Demmon. 5 pp. Lake States Forest Expt. Sta., St. Paul, Minn. Misc. Rept. No. 16. Mimeog. 1951.

Timber Survey of the Hocking State Forest. By E. A. Conway. 29 pp. Illus. Ohio Agric. Expt. Sta., Wooster. Research Cir. No. 3. 1950.

Logging and Milling

Holt! T'Other Way! . . . raftsmen . . . in the Delaware Country. 252 pp. Illus. Publ. by the author, L. C. Wood, Middletown, N. Y. 1950. $6.50.

Illustrated Forest Activities No. 1—The Harvest. 13 plates. British Columbia Forest Serv., Victoria. 1950.

Men, Mills and Timber; Fifty Years of Progress in the Forest Industry. 50 pp. Illus. Weyerhaeuser Timber Co., Tacoma 1, Wash. 1951.

Protection

Clearwater Timber Protective Association Annual Reports 1949-1950. 62 pp. Illus. Orofino, Idaho.

Control of Nonsubterranean Termites. By T. E. Snyder. 16 pp. Illus. U. S. Dept. of Agric., Washington 25, D. C. Farmers Bul. No. 2018. 1950. 5 cents (Govt. Print. Off.)

Range Management

The Behaviour of the Grazing Animal: A Critical Review of Present Knowledge. By D. E. Tribe. Jour. of the British Grassland Soc., Walsingham, Norfolk, England. Vol. 5, pp. 209-224. September 1950.

Halogeton glomeratus, a Poisonous Plant in Nevada. By L. M. Burge. 11 pp. Illus. Nevada State Dept. Agric., Carson City. 1950.

Manual of the Grasses of the United States. By A. S. Hitchcock. Ed. 2 revised by Agnes Chase. 1051 pp. Illus. Supt. of Doc., U. S. Govt. Print. Off., Washington 25, D. C. U. S. Dept. Agric. Misc. Pub. No. 200. $3.

Recommendations for Range Reseeding in Utah. By an Interagency Committee. 11 pp. Illus. Utah State Agric. Col. Extension Serv., Logan. Bul. No. 212. January 1951.

Reseeding Sagebrush Lands of Western Colorado. By A. C. Hull and others. 23 pp. Illus. Colorado Agric. & Mechan. Col., Fort Collins. Extension Serv. Bul. No. 413-A. December 1950.

Recreation

National-Forest Vacations. 60 pp. Illus. U. S. Forest Serv., Washington 25, D. C. 1950. 25 cents (Govt. Print. Off.)

Silviculture

Improved Practices in Propagation by Seed. By L. C. Chadwick. 15 pp. Herbst Bros., 92 Warren St., New York. Reprinted from American Nurseryman. 25 cents.

The Selection of Tree Species; An Ecological Basis of Site Classification for Conditions Found in Great Britain and Ireland. By M. L. Anderson. 184 pp. Illus. Oliver & Boyd, Ltd. 98 Great Russell St., London W. C. 1. 1951. 12s. 6d.

Some Principles Governing the Growing of Redwood Crops. By Emanuel Fritz. 8 pp. For Western Forestry & Conserv. Ass'n. Meeting in San Francisco Mimeog. Dec. 6, 1950.

Soils

Physical Properties of Forest Soils as Related to the Site Index of White Pine. By H. E. Young. 2 pp. Univ. of Maine Dept. of Forestry, Orono. Tech. Note No. 2. 1950.

Wood Technology and Utilization

American Woods. By S. E. Schoonover. Illus. Watling & Co., 406 Wilshire Blvd., Santa Monica, Calif. April 1951. $7.50.

Available Wood for Industry in the State of Washington. Folder and map. Inst. of Forest Products, Univ. of Washington, Seattle 5. Summary Rept. No. 1. 1951.

Churches. Illus. Timber Engineering Co., Washington 6, D. C. 1951. Free.

Colonial Timbers. By C. W. Bond. 190 pp. Illus. Stobart & Son, Ltd., London S. W. 1. 1950. 30s-9d.

Handbook of the Northern Wood Industries; enl. ed. 1500 pp. Swedish Timber and Wood Pulp Journal, Book Publ. Dept., Stockholm, Sweden. 1951. 50 Sw. cr.

Some Factors Involved in the Promotion of Alder-Using Industries in Tillamook, Oregon. By W. J. Baker. 35 pp. Oregon Forest Products Labs., Corvallis. Special Rept. No. 1. Mimeog. 1951. Ltd. distribution.

Timber for Recreational Buildings. 24 pp. Illus. Timber Engineering Co., Washington 6, D. C. 1951.

Society Affairs

Compiled by ROBERT D. HOSTETTER, *Assistant Executive Secretary*

Officers and Members of the Council, 1950-1951

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Forest Type Committee To Revise Bulletin

Under authorization of the Council, President C. F. Evans has appointed a Committee on Forest Types. The specific assignment of this committee is to revise the Society's bulletin *Forest Cover Types of the Eastern United States*. This bulletin, published in 1940, is now out of print.

After the committee has revised the descriptions and nomenclature of the eastern forest types, the bulletin will be combined with the Society's other bulletin *Forest Cover Types of Western North America* and issued as a single publication.

Chairman of the committee is F. H. Eyre of the Lake States Forest Experiment Station, St. Paul 1, Minn. The other members are:

William A. Dayton, U. S. Forest Service, Washington 25, D. C.

Daniel DenUyl, Department of Forestry, Purdue University, Lafayette, Ind.

R. C. Hawley, R. D. 1, West Cheshire, Conn.

Philip R. Wheeler, Southern Forest Experiment Station, Federal Office Building, New Orleans 12, La.

A committee of the Canadian Institute of Forestry is cooperating with the S.A.F. committee to include descriptions of Canadian forest types.

Any member of the Society who may have suggestions or who is willing to assist on this project is invited to notify the chairman or the neareast committee member.

Council to Review Policy Recommendations

Membership, Divisions, Budget Also Slated for Consideration

President Charles F. Evans has called a midyear meeting of the Council to transact Society business. It will be held on June 3-6 at Manitou, Colo.

Among the items which will be considered by the Council are:

1. A clarification of membership qualifications as a guide for Section membership committees as requested by Section delegates at the 1950 meeting. This project is being studied by the Council Committee on Membership (Demeritt, Kaufert, and McArdle, chairman).

2. Action on a report of a special Council committee which is making a study of the organization of subject Divisions (Lindh, Porter, and Fontanna, chairman).

3. A review of the recommendations of the Committee on Accrediting with respect to the curricula in accredited schools that qualify graduates for immediate admission to Junior Membership.

4. A review of recommendations by a special committee appointed to study Society policies and objectives (Brundage, chairman).

5. Rotation of annual meetings of the Society, as requested by Section delegates.

6. Further consideration of the Society's budget, the *Foresters' Field Manual*, JOURNAL advertising, and related business matters.

7. Appointment of a new Committee on the History of Forestry, and action on a proposed joint project with the National Research Council to make a study of research in forestry in the United States.

Any Sections or individual members who have suggestions for matters which the Council should consider, time permitting, at this meeting are invited to submit them in writing to the president or the executive secretary.

E. T. Clark Appointed to Safety Code Committee

E. T. Clark has been appointed as the Society's representative on the Sectional Committee to revise the Logging and Sawmill Safety Code, B13. Mr. Clark is secretary-manager of the Pacific Northwest Loggers Association, Seattle, Wash. Seth Jackson, safety officer for the U. S. Forest Service, Washington, D. C. will serve as the Society's alternate representative.

The original code was prepared 1924. Its revision is necessary at this time, particularly the part on logging and transportation, because of the widespread use of power saws, tractors, bulldozers, logging trucks, and other recently developed equipment not previously covered by the code.

Working subcommittees on felling and bucking, loading, and log transportation will be set up and will sub-

mit tentative reports for consideration by the Sectional Committee when it meets on October 8 to 12, 1951 in Chicago, Ill.

Representation on the Sectional Committee is determined by the American Standards Association, but the Committee will make the final rulings regarding the content of the Logging and Sawmilling Safety Code. The National Bureau of Standards in the U. S. Department of Commerce assists in handling the mechanics of the Committee's work.

Wildlife Division Meets in Milwaukee

An open meeting of the Society's Division of Forest-Wildlife Management was held March 6 in Milwaukee during the 16th North American Wildlife Conference. Some 35 members and guests attended. Chairman Warren W. Chase presided.

Under the guidance of Ralph R. Hill, the group held an informal discussion on predatory animal control in the forests of North America. Among those participating were Bruce Wright of New Brunswick, Neil Hosley of Alaska, Dr. Staebler of the University of Michigan, Clifford C. Presnall of the Fish and Wildlife Service, D. I. Rasmussen of the Forest Service, S. A. Graham of the University of Michigan, and Dr. Cole of the National Park Service. The consensus of the discussion was that there is need for education to develop public opinion favorable to the maintenance of proper balances of animal populations.

A second subject discussed was the desirable amount of wildlife management education in the training of a forester. This discussion was led by Dr. Harold W. Steinhoff of Colorado A & M College, chairman of a committee of the Division to study the place of wildlife management in the forestry curriculum. (See the report of the previous meeting of the Division of Forest-Wildlife Management in the February issue of the JOURNAL OF FORESTRY, pages 139-140.)

It was brought out that although some schools require a wildlife course of forestry majors, in general there are so many required courses that it would be difficult to fit a required wildlife course into the forestry curricula of some schools. S. T. Dana commented that while most schools believe a wildlife management course is desirable it is not essential. Chairman Chase asked Dr. Steinhoff's committee to continue the study of how best to train both foresters and wildlife managers, and how to integrate this training.

Dr. Paul D. Dalke, chairman of the subject matter Committee on Wildlife for the *Foresters' Field Manual*, reported that considerable material has been gathered for the manual. The deadline for submitting material is May 1, after which the editorial committee will prepare the typescript for the publisher. It is hoped to have the book published early in 1952.

In the unavoidable absence of Lee A. Yeager, associate editor of the JOURNAL OF FORESTRY for wildlife management, Henry Clepper made a plea for additional papers on forest wildlife. The JOURNAL desires more articles in this field and, if suitable, will be accepted from nonmembers as well as members of the Society.

Chairman Chase thanked those who participated in the meeting, and invited suggestions for Division activities.

MERLE A. GEE,
Secretary pro tem.

Latimer Describes Cooperative Forestry

The winter meeting of the Upper Mississippi Valley Section was held on March 9 and 10 at Brainerd, Minn., with an attendance of 80 members and guests.

Chairman Galen W. Pike presided at the business session on Friday afternoon, March 9, held in the American Legion hall. Committee reports and reports of the activities of the Section's five chapters were presented.

An explanation of the work of a forester engaged in cooperative forest management was given by Myron J. Latimer of the Minnesota Division of Forestry, with further comments by Emil Kukachka.

At the Section dinner, served in the Ransford Hotel, members who had attended the Society's 50th anniversary meeting in Washington, D. C. last December, described the conference. Henry Clepper gave a brief report on Society and professional affairs, and reminded members of the forthcoming election of officers and Council members next fall. C. R. Magney, associate justice of the Supreme Court of Minnesota and chairman of the Keep Minnesota Green Committee, gave an account of a recent trip to southeast Africa.

On Saturday morning the members visited local wood utilization plants in Brainerd.

340 Students Apply For Membership

During the two months preceding March 26, a total of 340 forestry students were elected to Student Membership in the Society of American Foresters. The Student grade was established by the vote of the members on December 1, 1950, and administrative procedures were announced on January 23, 1951.

Most of the students who have applied for membership are in their senior year, although some applications have been received from eligible juniors and graduate students. More than one thousand seniors are eligible to apply for election.

Section representatives at the 25 accredited forestry schools assist students in applying for Student Membership in the Society.

Student Membership affords students an opportunity to become familiar with the objects, policies, and programs of the Society. Dues are $3 per calendar year and include subscription to the JOURNAL OF FORESTRY. Students who apply for Student Membership during April, May, and June will be required to pay dues of only $2.25 for the remainder of the year.

As a special measure to eliminate inconsequential paper work by Student Members, endorsers, and the Society office, the application forms already submitted this spring by Student Members will suffice as applications for advancement to the Junior grade. They are not required to pay the usual $5 admission fee nor Junior Member dues for any part of the year in which they graduate. Junior Member dues for the following year are $6 and Section dues vary from $.50 to $2 (depending on the Section).

Students who wish to apply for Student Membership should file a standard application form with the Section representative at their school and pay him $2.25 for Student Member dues.

More than 10 students at each of the following institutions had been elected to the Student Member grade as of March 26: University of California, Colorado A & M College, University of Georgia, Iowa State College, Louisiana State University, Michigan State College, University of Minnesota, State University of New York, North Carolina State College, Oregon State College, Purdue University, University of Washington, West Virginia University, and Yale University.

Council Nominations Initiated by Members

Any voting member of the Society who is in good standing may initiate a petition for the nomination of an officer or other member of the Council. Nominating petitions require the signatures of ten voting members. The May and June meetings of those Sections which are concluding a winter series of meetings or the summer field meetings of the Sections which hold two meetings annually provide excellent opportunities for the selection of candidates who could capably lead the Society.

October 8, 1951 is the deadline for the submission of nominating petitions to the Society office. New officers will be elected by ballot on December 1, 1951 to serve during 1952 and 1953. If at all possible, nominating petitions should be submitted to the Society office during May, June, July, and August in order to facilitate the publication of photographs of candidates in advance of the election.

A president, vice president, and nine other Council members will be elected. The number of nominating petitions to be accepted is not limited, and all voting members may designate their relative preference for candidates listed on the ballots.

Forms of petition to use are:

"We, the ten or more undersigned voting members of the Society of American Foresters, hereby nominate _____ for the office of president for the two-year term of 1952 and 1953."

"We, the ten or more undersigned voting members of the Society of American Foresters, hereby nominate _____ to serve as a member of the Council for the two-year term of 1952 and 1953."

No nominations for the office of vice president are required, since the presidential candidate receiving the second highest number of votes is elected vice president.

Rules governing the nomination of officer and Council member candidates include the following:

1. All candidates must be Members or Fellows in good standing and state in writing their willingness to serve if elected.

2. Each petition must be for one candidate only and must be signed by at least ten voting members who are in good standing. A voting member may sign only one petition to nominate a presidential candidate and only one petition to nominate a Council member. Persons in the following grades are voting members: Junior, Member, and Fellow.

3. Petitions must be in the office of the Society of American Foresters, Mills Building, Washington 6, D. C. by October 8, 1951.

In the 1949 election there were 21 candidates nominated for consideration as members of the Council and two candidates for the office of president. In the event that fewer than nine Council member nominations or two presidential nominations are received, the balance will be nominated by the Nominating Committee. The committee is composed of the following members:

Chairman, Alf Z. Nelson, R.F.D., New Ipswich, N. H.

William C. Postle, Box 351, Winnfield, La.

Everett L. Hamilton, U. S. Forest Service, Glendora, Calif.

Alex J. Yorman, Box 83, Solon Springs, Wis.

Vincent Bousquet, Box 133, Centralia, Wash.

Prompt Dues Payment Mutually Advantageous

Over 60 percent of the Society's 7,200 members had paid their 1951 dues by March 31. Dues are being paid much more promptly than usual this year, according to Miss L. Audrey Warren, Society business manager.

Prompt payment of dues assists the Society in budgeting expenditures more accurately and also is advantageous to members, since the delivery of Society publications and participation in Society activities are not interrupted, should active membership lapse.

June 30 is the deadline for the payment of 1951 Society dues. After that date, members whose dues are not paid are declared to be in bad standing, do not receive the JOURNAL OF FORESTRY, and cannot vote until dues are paid.

Members in bad standing can be restored to good standing by payment of their 1951 dues prior to November 30. Issues of the JOURNAL which had been missed will be mailed to members who are restored to good standing.

If dues for 1951 are not paid by November 30, 1951, the end of the Society's fiscal year, membership must be terminated in accordance with By-law 21.

Former members who were dropped for nonpayment of 1950 dues may be reinstated upon application by payment of back dues not to exceed those for one-half year plus current dues. Members dropped prior to 1950 must pay back dues for an entire year.

Members now serving in the armed forces may apply for inactive status during such military service if they wish, but most prefer to maintain contact with their profession.

Outstanding Members Recognized Biennially

Fellows Elected This Year

The highest membership distinction that can be conferred by the Society will be bestowed this year on Fellows elected from among candidates nominated by petition. Although any Member or Fellow may sign a petition to nominate a Member for election to the Fellow grade, election is not by the membership at large, but by a special board of electors. The board of electors consists of the present Council and all previously elected Fellows. At the present time there are 56 living Fellows. They are listed below. To be elected, a candidate must receive an affirmative vote of not less than one-half of the total votes cast.

The election of Fellows will be on December 1, 1951, but all nominations must be in the Society office by October 8, 1951.

Nominations already received include those for Hugh Curran, Emanuel Fritz, DeWitt Nelson, and Harold S. Newins.

Nominating petitions must be signed by at least 25 Members or Fellows in good standing. A suitable form of petition is:

"We, the 25 or more undersigned Members and Fellows of the Society of American Foresters, hereby nominate _____ to be considered for election to the grade of Fellow in 1951."

As defined by the Constitution (Article III, Section 6), "Fellows shall be foresters of outstanding achievement as leaders in responsible directive or distinctive individual work of a fruitful character. They shall be elected from the Members and shall be engaged in forestry work at the time of their election."

Rules governing the nomination of Fellow candidates include the following:

1. All candidates must be Members in good standing.

2. Each petition must be for one

candidate only and must be signed by at least 25 Members or Fellows who are in good standing. The number of Fellow petitions a member may sign is not limited.

3. Each petition must be accompanied by a factual, not eulogistic, biographical sketch of at least 200 words giving an account of the candidate's education, professional career, and accomplishments. If available, a photograph of the candidate should be submitted.

4. Petitions must be in the office of the Society of American Foresters, Mills Building, Washington 6, D. C. by October 8, 1951.

List of Fellows

Since the Society was founded in 1900, there have been 81 Fellows elected. At the present time the number of living Fellows is 56.

Since the last election in December 1949, five Fellows have died: H. P. Baker, C. G. Bates, E. G. Cheyney, J. C. Gifford, Henry S. Graves, and A. S. Peck.

The current roster of Fellows follows. The state in which each Fellow is domiciled and the year of his election are shown after his name.

Allen, S. W. Michigan. 1948.
Baker, F. S., California. 1949.
Brundage, F. H. Oregon. 1949.
Besley, F. W. Maryland. 1940.
Butler, Ovid. Maryland. 1940.
Carter, E. E. District of Columbia. 1942.
Chapman, H. H. Connecticut. 1922.
Clapp, E. H. Maryland. 1930.
Clepper, Henry. Virginia. 1949.
Coffman, J. D. District of Columbia. 1946.
Dana, S. T. Michigan. 1935.
Eldredge, I. F. Louisiana. 1942.
Evans, C. F. Georgia. 1949.
Ferguson, J. A. Pennsylvania. 1949.
Fischer, A. F. California. 1940.
Frothingham, E. H. California. 1942.
Gill, Tom. District of Columbia. 1948.
Girard, J. W. Oregon. 1944.
Granger, C. M. District of Columbia. 1946.
Greeley, W. B. Washington. 1918.
Guthrie, J. D. Virginia. 1942.
Hall, W. L. Arkansas. 1940.
Hartley, Carl. Maryland. 1949.
Hawes, A. F. Connecticut. 1939.
Hawley, R. C. Connecticut. 1942.
Holmes, J. S. North Carolina. 1939.
Hosmer, R. S. New York. 1932.
Illick, J. S. New York. 1946.
Jeffers, D. S. Idaho. 1948.
Kelley, Evan. Montana. 1949.
Kellogg, R. S. Florida. 1949.
Kinney, J. P. District of Columbia. 1942.
Koch, Elers. Montana. 1940.
Korstian, C. F. North Carolina. 1942.
Lowdermilk, W. C. California. 1948.
MacDonald, G. B. Iowa. 1944.
Marsh, R. E. District of Columbia. 1948.
Martin, C. S. Washington. 1948.
Mason, D. T. Oregon. 1948.
Mulford, Walter. California. 1939.
Munger, T. T. Oregon. 1946.
Munns, E. N. District of Columbia. 1949.
Peavy, G. W. Oregon. 1939.
Preston, J. F. Maryland. 1948.
Schmitz, Henry. Minnesota. 1940.
Show, S. B. District of Columbia. 1948.
Siecke, E. O. Texas. 1946.
Sparhawk, W. N. New Hampshire. 1946.
Spring, S. N. New York. 1939.
Watts, L. F. District of Columbia. 1946.
Wilson, Ellwood. Quebec. 1949.
Winslow, C. P. District of Columbia. 1942.
Wirt, G. H. Pennsylvania. 1948.
Ziegler, E. A. Florida. 1949.
Zon, Raphael. Minnesota. 1918.

Utilization Men Object to Bylaw 5

In a continuation of the discussion regarding the courses which a student should complete to qualify for Junior Membership, Class A, in the Society, the opinions of some professors who teach utilization courses in four accredited institutions are published below. Also published is a letter written by Myron E. Krueger, chairman of the Society's Committee on Accrediting Schools of Forestry, in which he states the reasons why and the means by which the list of courses required for election to the Society immediately upon graduation was established. The required courses are included in Bylaw 5, which was published on page 57 of the January 1951 JOURNAL OF FORESTRY.

On December 10, 1949 the membership voted to retain the "present, professional base for membership" (see page 56, January 1950 JOURNAL OF FORESTRY). At that time the professional base for membership consisted of three items (1) Article III, Section 4 of the Constitution, the pertinent part of which stated, "Junior Members shall be graduates of a school of forestry approved by the Council," (2) Bylaw 5, which stated in part, "Theoretical training in the fundamental principles of professional forestry is the basic requirement," and (3) the policy action by the Council in adopting the five basic courses (with their prerequisites) as the minimum requirements for entrance to the Junior grade. At the present time, the only change is that the policy action is now part of Bylaw 5.

However, in the discussions prior to the 1949 referendum, the developing curriculum in forest products was seldom even mentioned, and in the prior as well as the present discussions little mention is made of the present curricula in forest recreation, fisheries, and conservation. Also to be considered is the possibility that full-fledged curricula may eventually develop in forest entomology, forest soils, naval stores, and other segments of what *Forestry Terminology* defines as "the scientific management of forests for the continuous production of goods and services." The Constitution does not define forestry, although Article XII recognizes "special fields of forestry."

In the course of the present discussion, no expressions have yet been received in the Society office from the chairmen of any of the Society's Divisions or Sections.

A statement by Wm. M. Harlow and letters from David P. Thomas, A. J. Panshin, Myron Krueger, and James S. Bethel follow.

Does New Bylaw 5 Offend the Spirit of the Constitution?

At some by-gone meeting of the New York Section of the S.A.F., a man of truly prophetic vision stated, "What is needed in this country is a professional society broad enough to include *all* those who deal with forest land and its products." On page 8 of the S.A.F. constitution (March 1950) under the qualifications for Member grade, there appears the following: "Forestry work shall include *all* activities having to do with the management of forest land and the *utilization* of *any* of its resources." Farther down the page forestry work shall include ". . . forest utilization including logging, manufacturing, and sale of products; research in any or all of the above fields; etc." On the masthead of the JOURNAL OF FORESTRY there appears a list of Associate Editors. One of these represents *Forest* and *Wood Utilization*. This man and hundreds of other members like him, graduates from formerly "accredited" curricula in utilization and wood technology, now would be barred, upon graduation, from *both* Junior and also Affiliate membership in the Society![1]

For many years, certain individuals in the Society have worked to narrow the definition of a forester to one who propagates, manages, and perhaps harvests crops of timber. These purists seem at last to have succeeded through the new Bylaw 5 in splitting the Society in two. At a time in history when we need unity and cooperation rather than dissension, we find graduates in forest utilization and wood technology denied admission into the Society, on *any* professional level! At last the "foresters" have triumphed over the "wicked lumbermen." To those of us who have worked for 25 or more years with our students and others, to bring about understanding and mutual respect between these two factions, the present situation presents a sorry spectacle.

To give the "foresters" due credit for honorable intentions, it must be assumed that the required courses under Bylaw 5 are considered sufficient to permit a man to practice "forestry" or provide at least a common platform of understanding upon which all foresters may meet to discuss their problems. If this is not so, then why split the Society over a mess of pottage? Why not admit that the utilization of forest products has become such a vast and complex field that students simply haven't the time to take courses in management, soils, and fire protection? This is especially true now when pressure is being exerted by the profession to include additional liberal arts subjects in an already overloaded curriculum.

Let us look once more at Bylaw 5, Class A. "Graduates in approved *curricula* in institutions accredited by the Council of The Society of American Foresters shall be eligible for election to the Junior Member Grade on the endorsement of three voting members. For a curriculum to be approved it must include the following professional courses: Silviculture—3 semester units (based on ecology—3 semester units; botany, plant physiology and dendrology—6 semester units, and soils—3 semester units); Protection (fire, insects, or disease)—

[1]Wrong. Any specialist in forest and wood utilization is eligible and welcome to membership who has completed the five basic professional courses of which utilization is one.—Executive Secretary.

3 semester units; Management—3 semester units (based on mensuration—3 semester units, surveying—3 semester units and mathematics through trigonometry); Economics—3 semester units (based on general economics—3 semester units); and Utilization—3 semester units."

Just what caliber of courses in botany, plant physiology, and dendrology can be given in a total of 6 semester hours? Any good course in elementary college botany requires two semesters of 3 hours each (total 6), plant physiology three hours, and dendrology for "production foresters" a full year (6 hours). Here is a minimum of 15 hours, but the framers of Bylaw 5 shrug it off with 6 hours, and then speak of it as "professional" (see above). Bylaw 5 then is neither fish, flesh, fowl, nor good red herring. It does not provide sufficient basic training for a practicing "forester," but at the same time includes a number of courses too specialized for men going into the utilization field.

What then should we provide as a "meeting ground" for students who are going into some phase of one of the most complex and diversified professions in the world? This writer is of the opinion that a suitable year's course in general forestry, and a good grounding in botany, chemistry, mathematics, and physics is sufficient for any specialist in one phase of forestry to understand or soon appreciate the problems of another specialist or "general practitioner." Furthermore, courses in botany, mathematics, chemistry, and physics should include many problems of interest to foresters. Why is it "better" botany to study a bean seedling than it is a beech seedling, or better mathematics to solve abstract problems than those connected with logging? All our basic courses need overhauling. Without sacrificing one iota of the fundamentals, they could be made intensely interesting to our students by introducing examples of their usefulness to foresters.

To summarize, Bylaw 5 as voted through by about half of our membership (the others abstained) is in the process of splitting the Society from top to bottom.[2] Those of us in the field of wood technology and utilization can either remain in the Society and work toward a reversal of the action recently taken, or we can resign in protest, and hereafter consider the Forest Products Research Society as our professional group. Forest production and utilization are Siamese twins. To separate them may not be fatal, but it will certainly stunt their growth.

Bylaw 5 has turned back the hands of the clock 50 years, and has again stirred up the conflict between the "foresters" and the "wicked lumbermen,"—a stupid conflict anyway, and one which is totally out of step with the best interests of the Society and the nation.

Bylaw 5 does not provide adequate training for a "production forester," while at the same time it bars men in wood technology and utilization from joining the Society (these men do not have time to take the specialized courses now required).

Finally Bylaw 5 does offend the spirit if not the letter of the Society's Constitution.

The only question now to be asked is, what are "we" going to do about it? Since those of us in the forest products branch are probably in the minority,[3] it seems fitting that we ask the rest of the membership, "Now that you have barred our students from joining the Society, what do you think our attitude should be toward this organization?"

WM. M. HARLOW,
Department of Wood Technology,
State University of New York,
College of Forestry.

[2]Wrong. Bylaw 5 was not voted through by the members. The membership voted to amend the Constitution, but only the Council amends the bylaws. Bylaw 5 was unanimously approved by the Council on June 20, 1950 (see the JOURNAL for August 1950, pages 367-368) to become effective if and when the members approved the basic amendment to the Constitution, which was done on December 1, 1950 (see the JOURNAL for January 1951, pages 56-57).—Executive Secretary.

[3]In the February JOURNAL, on the same page with the report of the Accrediting Committee, there is a letter from the President of the National Lumber Manufacturers Assoc. He points out that 3,000 members of the S.A.F. are employed by the forest products industries! Of these more than half are in management, so that less than one quarter of the membership is in some form of utilization. —Author.

March 7, 1951

DEAR MR. CLEPPER:

It is with considerable trepidation that I forward my annual dues to the Society. As a graduate of the forest products curriculum at the University of Washington and as a professor in the same department, there is little future for me in the Society if the present narrow definition of a "forester" as recently outlined by the Society is to be followed.

I feel that I am playing the role of a hypocrite to stand before my forest management and logging engineering majors and presume to be a professor in a recognized forestry school that isn't even a "forester." The role of hypocrite is further enhanced in wearing the shield of an S.A.F. member before my forest products majors who are barred from membership in the Society but whose training will ultimately be the equivalent of mine.

Associations as intimately entwined as land management and product utilization of material produced on the land cannot be torn assunder by the mere whims of the "moss-back dirt foresters" that apparently gave birth to this rebellious classification of a "forester."

Herewith my dues for 1951; a year that I am devoting to the fight for recognition of our trained scientists and technicians in the field of forest utilization. If we of the products field lose this fight with the narrow minded group mentioned above, make my resignation in the Society effective as of January 1, 1952.

DAVID P. THOMAS,
Assistant Professor of Forest Products,
University of Washington.

March 12, 1951

DEAR MR. CLEPPER:

I am not sure whether this letter should be addressed to you or to the chairman of the Committee on Accrediting of Schools. I have decided to address it to you because I would like to have this letter published in the JOURNAL OF FORESTRY as a statement explaining why, after more than twenty years of membership in the Society of American Foresters, I am considering dropping out of the Society.

My action is, of course, motivated by the announcement that the Council has unanimously approved the recommendations of the Committee on Accrediting which henceforth will bar from membership the graduates of all but strictly forest management curricula.

The more compelling reason for my contemplated action, however, is even more fundamental. I no longer find myself in agreement with the professional objectives of the Society. The action on accrediting of curricula and the question of eligibility of the graduates are only facets of a much larger pattern that permeates the thinking of a faction within the Society. To speak quite frankly, it can be summed up as an antagonistic attitude toward private (as contrasted with public) ownership of forest lands and the question of policies involved in the harvesting and utilization of the forest products from such lands.

The crux of the matter to me, as no doubt to many other professional men, is whether forest management policies in the United States are to be the result of directives, or whether they should be allowed to evolve gradually, as dictated by sound economics. I, for one, believe that in the final analysis, sound principles of forest management applied to the private lands will be accepted only when these are linked with equally sound forest products utilization practices. It is, in fact, undeniable that it is only through more effective methods of forest products utilization that any form of forest management on privately owned lands becomes feasible. Certainly it is not the other way around.

And how do we achieve more efficient forest products utilization? The answer, of course, is through the efforts of technical people who show the way to profitable utilization of what formerly was regarded as waste; people who develop new techniques in harvesting and manufacture of the forest products. It is they, and the people who translate their ideas into economically sound procedures, that in the final analysis make the application of forest management principles possible on the privately owned forest lands. What should be more logical than to have all these people united in one professional Society, on the basis of one fundamental concept, that of conservation of natural resources, as underlying objective for membership in the Society? In fact that is what the constitution of the Society provided for by stating, in requirements for Member grade, that "forestry work shall include all activities having to do with the management of forest land and the utilization of any of its resources." In fact it further clarifies the point by stating that forestry work shall include ". . . forest utilization including logging, manufacturing, and sale of products; research in any or all of the above fields." But the constitution also states that "Individuals who have not qualified for Junior Membership cannot obtain the Member grade." From this it appears that the present action of the Council very effectively counteracts the provisions of the constitution for requirements for Member grade, by disallowing such potential members Junior membership to begin with. I am aware of the fact that the nonqualifying graduates can later on, through good behavior, become eligible for membership. But let us not deceive ourselves that many of them would.

If we accept the broader interpretations of forestry work, as defined in the constitution of the Society, then what logic is there in the recent action of the Council in excluding from membership the very men who will be engaged in these activities? If, on the other hand, the recent action interprets accurately the current thinking of the majority of the Society's membership, then this constitution should be amended. In that case, of course, there is no place in the Society for technically trained men in the fields of wood utilization, wood technology, forest recreation, or range management.

One may pardonably speculate on what the long-range effect on the fortunes and the professional influence of the Society of American Foresters will be as a result of this hasty action. It is easy to see how, by excluding young men with training in the fields other than forest management, the Society of American Foresters will become a professional society for the narrowly trained specialists in but one phase of what the less narrow minded people regard as the professional scope of forestry. The other professional societies will, of course, happily absorb "the outcasts." It is, indeed, difficult to escape the conclusion that the influence of the S.A.F. in professional matters pertaining to the broad field of forestry and natural resources will decline, and that of some other Society, or group of societies, will grow at its expense.

A. J. PANSHIN,
Department of Wood Utilization,
Michigan State College.

March 15, 1951

GENTLEMEN:

This letter is being written as a contribution to the discussion of "Eligibility for Junior Membership in the Society of American Foresters," which was reopened by Dean R. J. Preston of the School of Forestry at North Carolina State College in his letter of January 22, 1951 to President Charles F. Evans. I feel compelled to enter this discussion in view of my chairmanship of the committee which formulated the statement on eligibility for membership as printed on page 1009 of the December 1949 issue of the JOURNAL. Basically it is this statement of principles to which Dean Preston objects.

At the outset it should be pointed out that the statement on eligibility, just referred to, does not deny membership in the Society to anyone. The statement merely sets up the bedrock educational requirements for those who wish to become members of the Society *immediately following graduation* from an accredited forestry school. In effect the statement simply puts into more definite language the principle that has always applied,—that those who are lacking in formal forestry education must qualify for membership on the basis of experience.

The question might well be asked, "Why was any statement on eligibility necessary?" In my opinion any professional society limits its membership to those who have something to contribute to the stated objectives of the organization. Usually these stated objectives relate to the maintenance and strengthening of professional standards to which a solid, substantial core of professional subject matter is basic. As regards educational qualifications for membership in the Society of American Foresters, no great difficulty was encountered until the specialized or adjunctive fields of study, which started out as courses, were expanded into curricula. In most cases this expansion has been effected through the deletion of forestry courses. In some instances in the field of forest products this substitution of courses in forest products for courses in forestry has developed to the point where no subject matter in ecology or silviculture or management or all three remains in the curriculum. To extend the privilege of membership in the Society to the graduate of such a curriculum, *immediately following graduation,*

merely because the curriculum is under the administration of an accredited school and to deny membership, *immediately following graduation*, to a person who has pursued a substantial curriculum in forestry in an institution not yet accredited seems quite illogical from the standpoint of stated objectives of the Society. Certainly the latter individual is in a better position to make a contribution to professional discussion than the former. When the Committee on Accrediting was given the added job of reviewing this phase of membership in 1948, it seemed to the members of the Committee that the situation was equally illogical with reference to graduates from some specialized curricula in range management and wildlife management. As a consequence the Committee decided that to clarify the situation there should be a definite, clearcut statement of the bedrock subject matter requirements for those who seek election to the Society immediately following graduation,—that is, solely on the basis of education.

I hope that no one will interpret these remarks as a criticism of those schools which have established specialized curricula in fields other than forestry. In many institutions it is only within the schools of forestry that these curricula will receive the sympathetic development that they deserve. The sole criterion for the establishment of any curriculum should be the needs of those who are going to use the subject matter involved. If those who are to become specialists in forest products, range management, or wildlife management will receive better training for their specialties with fewer courses in forestry, that is the training they should receive. Eligibility for election to the Society of American Foresters should not become one of the criteria.

The only point at issue here is whether the Society is justified in establishing the standards for membership that are stated in the December 1949 JOURNAL. In my opinion any society has a right to establish any standards for membership that it chooses. The qualifications as stated do not seem to be at variance with the majority opinion as expressed in the 1949 referendum on membership. However, if this renewed discussion should indicate that the majority is in favor of reversing the 1949 vote—that is, in favor of a wider base for membership—then we must all accept the wishes of the majority. However, in that event we should be equally honest in ceasing to call ourselves a "professional society." If we induct into the Society graduates in wildlife management, range management, and forest products, in their highly specialized forms, on an equal basis with graduates in forestry, then we no longer have the attributes of a profession. To be entitled to such an appellation we must have a much greater core of professional subject matter common to all curricula than is the case at the present time.

On the other hand, if this discussion sustains the 1949 referendum then we must make a real effort to make that majority opinion work. May I repeat that in my opinion the statement of membership qualifications is merely the application of standards that have always been the objective of the Society. To make these standards work will involve some responsibility on the part of the deans and faculties of forestry schools to assist the students in accepting the viewpoint of the Society. There is certainly no intent by the statement of membership qualifications to "separate the sheep from the goats." The whole implication is that the specialized fields have now reached the point where they constitute sister professions and as such are entitled to have their own professional organizations.

If this renewed discussion does confirm the majority opinion of the 1949 referendum, we should continue the policy of the Committee on Accrediting in applying the eligibility statement with sympathetic judgment. In my opinion, there is every probability that some ten years hence the requirements for membership will become much more rigid than those stated in December 1949. We should attempt to make the transition as gradual as possible. The interpretation by the Committee on Accrediting of the eligibility statement has certainly kept this in mind. However, there is nothing to be gained by adopting the options suggested by Dean J. Lee Deen. This would constitute a circumvention of the eligibility statement solely on the basis of definition. We should take a clearcut stand on the granting of membership on the basis of education. We should either accept graduates of all specialized curricula on an equal basis with the graduates in forestry or we should make a start toward a stronger professional Society by using the qualifications as expressed in December 1949.

It is somewhat unfortunate that the discussion which has now been started did not take place at the time the statement of principles was first enunciated at the meeting of the Society at Boston in 1948. The discussion should have preceded rather than follow the Society referendum on membership of 1949. However, now that the question has been reopened, let us hope that there will be enough discussion to bring about complete clarification of the matter.

MYRON KRUEGER, *Chairman,*
Committee on Accrediting.

March 8, 1951

DEAR MR. HALL:

I would like to submit to you my views on the question of the place of Wood Technologists in the Society of American Foresters. In reviewing the recently published report of the Committee on Accrediting Schools, I note that almost half of the accredited forestry schools have curricula in the wood technology and forest products field whose graduates do not qualify for membership in the Society upon graduation. I believe that it is safe to say that these curricula represent a response on the part of forestry schools to a demand by the wood using industries for men with a proper technical training in the field of wood technology. It has not been an accident that these wood technology curricula are included in Forestry programs rather than in Engineering or in other professional fields. The very essence of good technical training for a career in the wood using industries is an understanding not only of the structure and properties of wood and the methods used in its conversion to useful products but also an understanding of the biological origin of wood and its implications as far as wood utilization is concerned. Such a background can most satisfactorily be obtained through a study of many of the basic forestry courses. It does not, however, require a background in all of the fields of study basic to a career in forest management.

It would seem to be reasonably well established that from an educational standpoint the field of forestry is already broad enough to include wood technology. The problem which the Society must solve is whether it is going to confine its membership to those forestry graduates who are interested primarily in the forest management and its allied fields or whether it is going to include other important segments of the forestry profession. As a democratic organization it is certainly within the prerogatives of the Society to limit its membership in any way that the majority of the voting members elect to do so. I believe, however, that those members whose interest is primarily in the field of forest management should consider carefully whether their interests and that of the forestry profession as a whole are best served by exclusion of those members of the forestry profession who are primarily concerned with the utilization of wood rather than its production.

Many of the important problems which forest management men are currently attempting to solve could be handled more easily with the help of people concerned with wood utilization. The problems of utilizing weed species, low quality individuals of high valued species, small sized materials from laps and from improvement cuttings are very real to the forest manager. These problems will be solved through cooperation between the timber owner and the wood using industries. An increased effort on the part of manufacturers to utilize larger volumes of lower grades of logs and lumber would help the practicing forest manager. Greater interest on the part of many wood using industries in long range planning for a permanent timber supply for their plants would contribute to a sound forestry program.

It is common for the top policy making individuals in a wood industry to have come up through the manufacturing end of the business. It is these men who frequently have to be sold on the importance to their firms of sound forestry programs. The present movement of wood technologists trained in forestry schools into wood using plants promises to provide a nucleus of foresters on the manufacturing side of the fence who can work with foresters on the timber production side to their mutual advantage and to the advantage of a sound forestry program generally, provided these wood technologists continue their interest in forest production problems after they get out on the job. Action on the part of the Society of American Foresters to include among its members those foresters trained in wood technology and engaged in manufacturing pursuits would provide a meeting ground where common problems could be discussed and possibly solved.

At the present time there is no professional organization which meets the needs of foresters specializing in wood technology. If they are to be systematically excluded from the Society of American Foresters it is only reasonable to assume that they will ultimately form their own professional organization. Such a separation of two groups whose problems are fundamentally so closely related would be to the advantage of neither group. It is the writer's opinion that the Society of American Foresters, the bulk of whose members are engaged in the management phases of forestry, would be well advised to consider carefully whether the profession as a whole will not be better served by a single organization encompassing the whole profession rather than by two or more independent groups.

JAMES S. BETHEL,
Professor of Wood Technology,
North Carolina State College.

California Committee Assigns Priorities

A committee has been appointed in the Northern California Section to list the pressing forestry problems in California that are suitable for study by committees of the Section.

Persons on the committee include Myron Krueger as chairman, W. Robert Howden, Emery S. Escola, and L. N. Ericksen.

The committee adopted the following principles to guide it in selecting appropriate subjects:

1. Highly controversial issues should be avoided.

2. Subjects selected should not require research work in its generally accepted sense. Committees should rather assemble existing information or the results of research, analyze research, point out courses of action or lines of research for other organizations, and recommend generally.

3. Some topics should be suitable for study by committees distant from libraries and other study aids usually found in big population centers.

4. Young men, as well as more experienced foresters, should be encouraged to participate in the studies.

On January 16, the forest problems study committee recommended three subjects for study this year by committees of the Section. These subjects, in order of priority, are: (1) management of second-growth pine in Sierra Nevada foothills, (2) forest soils, and (3) a review of the bases, development, and effects of the traditional fire-exclusion policy for the Sierran mixed-conifer forest. Other desirable subjects for future study include forest practice rules, forestry education, management of second-growth redwood, preparation of stand structure tables for mixed conifers in western Sierra Nevada, trends in logging equipment and methods for continuous forest production, fuel reduction practices, a description of the Sierran

mixed-conifer forest just prior to the arrival of the white man, an evaluation of reforestation efforts, and relative long-term values of timber and forage production in the upper foothill lands of California.

New officers of the Northern California Section, elected to serve during the 1951-1952 season are: R. D. Roseberry, chairman, Diamond Match Co., Stirling City, Calif.; Henry J. Vaux, vice chairman, School of Forestry, University of California, Berkeley 4, Calif., and Thomas H. Harris, secretary-treasurer, Blister Rust Control, 2288 Fulton Street, Berkeley 4, Calif. Mr. Roseberry was advanced to the chairmanship from his previous assignment as vice chairman, while Mr. Harris was reelected. John Zivnuska will continue as membership chairman.

New England Section Hears of Developments

One hundred seventy members and guests attended the annual winter meeting of the New England Section held in Boston, Mass. on February 22 and 23.

"Recent Developments in Forest Management and Research" was the subject for a panel discussion in the first technical session. Participating were T. L. McLintock, Solon Barraclough, W. E. Killian, and C. M. Mathews.

John D. Gilmour then discussed "The Economic Problems of Forestry in Canada."

"Aerial Surveying for the Spruce Budworm in New England" was the subject of a paper presented jointly by J. L. Bean and R. C. Heller.

At the banquet on Thursday evening, Robert F. Chandler, president of the University of New Hampshire, spoke on some aspects of the study of forest soils in the United States. Harris Reynolds was the toastmaster.

On Friday morning, Colonel H. L. Fox, Corps of Engineers, U. S. Army, discussed "The Survey of the Natural Resources of New England and New York."

Concluding the technical sessions was a discussion of "Recent Developments in Wood Utilization and Logging" by a panel composed of E. L. Heermance and William Derosier.

Robert S. Monahan read a paper, prepared by L. C. Rawson, titled "A.F.P.I. Work in New England."

Business transacted by the Section included the appropriation of $50 to the Tree Pest Leaflet Committee and the establishment of more specific functions of the Forest Fire Control Committee.

A resolution was passed which called attention to the public detriment caused by the location of certain mining claims on western national forests. Under present laws it is possible for claim holders to prevent timber sales on the area, to hamper use of the area for recreational purposes, and in other ways prevent public benefits that otherwise would be possible.

Two new members of the executive council were elected, John H. Lambert, Massachusetts, and A. M. Koroleff, eastern Canada, but the Section's officers were reelected. They are: William C. MacAdam, chairman, Francestown, N. H.; R. S. Monahan, vice chairman and membership chairman, Hanover, N. H.; and Edwin L. Giddings, secretary-treasurer, Penobscot Development Co., Great Works, Me.

The summer meeting will be held in Massachusetts.

Bear Facts Committee Finds Stripping Bad

Over eleven percent of the Douglas-fir trees from 3 to 24 inches d.b.h. on a 1,880-acre tract were found to have been stripped by black bears, according to a report presented by Charles Tulloch at the March 2 meeting of the Puget Sound Section. Mr. Tulloch is chairman of the bear facts committee of the North Olympic Chapter. William A. Tinney, Puget Sound Section chairman, subsequently appointed a Section bear facts committee headed by William H. Larson. Mr. Larson will be assisted by Charles Tulloch, J. C. H. Robertson, Jack E. Winn, Norman P. Worthington, Charles C. Kirkwood, Oscar Levine, Walton L. Vincent, Donald R. Hopkins, William D. Hagenstein, and Hardin R. Glascock.

According to the committee, bears damage the trees by stripping the bark from the trunk, apparently to lick the sap from the inner bark and exposed wood. Injury varies from removal of a small patch of bark to complete girdling and may occur on any part of the stem from the base to as much as 50 feet up into the crown. All species of conifers are attacked although there appears to be a decided preference for Douglas-fir.

Evidences of damage have been reported in Mason, Grays Harbor, and Clallam Counties in Washington and in Tillamook County in Oregon.

In Grays Harbor County, the 1950 aerial survey made by the Bureau of Entomology located several areas of dead and dying trees resembling outbreaks of bark beetles. Later ground examinations disclosed that the damage was caused largely by bears. Of the 61,900 acres showing damage, 10,500 acres had losses approximating 30 percent of the stand.

The principal speaker for the Section's evening meeting, which was attended by 57 members, was Harold L. Simpson, executive vice president of the West Coast Lumbermen's Association. His subject was "Merchandising Forest Products."

Utah Chapter Organized

Chairman T. W. Daniel of the Intermountain Section reports the formal organization of a new Southern and Eastern Utah Chapter on February 23, 1951.

Officers are Albert Albertson, chairman, Cedar City, Utah; Victor N. Stokes, vice chairman, Richfield, Utah; Bert H. Tucker, secretary-treasurer, Cedar City, Utah and Howard Foulger, board member, Manti, Utah.

The group plans some active programs stressing wildland management problems of southeastern Utah that confront all the members.

Chapman Campaigns for Aggressive Action

Believing that to fulfill the Society's first and third objects the Council must initiate more aggressive action than was envisioned by its adoption of a policy on legislation in June 1950, H. H. Chapman reviews previous Council actions and results of referendums in the statement below and urges further discussion of the subject.

Concerning Referendums

The principle of the referendum is to permit the voting members of the Society to express their will regarding basic policies, for the instruction and guidance of the Council. It constitutes the one safeguard against the assumption of autocratic powers by the Council.

The Council is governed by the Constitution, which can be amended (Article 13) only by a two-thirds vote of the members voting. Except in Article II it deals solely with the definitions of membership, duties of officers and Council, publications, meetings and other matters of organization and functioning. Article II alone deals with policy and reads:

"The objects of this Society shall be to represent, advance and protect the interests and standards of the profession of forestry; to provide a medium for exchange of professional thought; and to promote the science, practice, and standards of forestry in America."

This platform embraces three prin-

ciples. The first covers the duty to the profession, its interests and its standards. The second provides for factual information and its dissemination. The third embraces public service and standards.

From an early date there has been a faction in the Society that would confine its activities to the second category. In 1925, when the annual meeting at Baltimore referred a proposed statement of policy to the Council, the latter decided, "It is the feeling of the Executive Council that the Society is a professional organization which should deal predominantly with facts and not opinions. Since the formulation of a specific forest policy involves chiefly an expression of opinion on which an agreement probably cannot be reached, it is the sense of the Executive Council that, as a general principle, it is inadvisable to enunciate policies providing for specific legislation." (Journal of Forestry 23: 201, 1925). This concrete statement represents an opinion still prevalent in the Society, that objectives 1 and 3 are not to be stressed, but ignored.

This position has by no means been consistently held. Council action, independent of referendums, has from time to time supported or opposed not only programs but specific legislation. Cases in which proposed laws were acted on by Council authority alone include for instance the McKellar bill S 575, providing for senatorial confirmation of government employees earning over $4500 per year, which was opposed (1938) (Objective 1); opposing the McCarran bill S 33 seeking permanent grazing rights on the National Forests (1947); approving the insect control bill S 1863 (1946) and the bill (HR 1850) for creating a national academy of science (1946). In other cases, the Council flatly refused to take a position on any specific legislation, as was the case with the Anderson bill for federal regulation (S 1820, 1949). In two cases of specific legislation, namely, that concerning the disputed lands claimed by the Department of the Interior for the Oregon and California authority, and the Quetico-Superior wilderness controversy in Minnesota, the Council acted on specific bills. On the O and C case, the Council voted to oppose HR 1688 in 1944, and so informed Congress. But in 1946, the president cast the deciding vote not to take action, and in 1948 the next president again decided a tie vote by opposing this bill. Finally, the matter was decided by a referendum in 1949. These cases are cited merely to show that precedents exist for action by the Council on specific legislation when need arises.

In many instances, however, the Council has preferred to express its views in the form of general policy statements, as was done in the case of the Quetico-Superior Wilderness area fight, when it approved exchange of land, acquisition of interior holdings, and compensation of local government for taxes, without mentioning specific bills. (Journal of Forestry 45: 221, 1947).

Shirley Allen in his article on the Society in *Fifty Years of Forestry in the U.S.A.*, page 281, calls attention to the first instance in which the Council took specific action in the interests of professional status in state forestry (1931) when the executive secretary was instructed to oppose the dismissal of W. T. Cox, state conservation commissioner of Minnesota. Further activity was displayed in this field during 1932-1935 as revealed in S.A.F. Affairs, in opposing political levies in Indiana, and against political appointments in the C.C.C. This latter activity, embodied in a committee report, brought about a referendum to suppress the report, on the part of one of the officials, a member of the Society, which was defeated. The report was published. Since that period the Council has taken no specific action of record in interfering in state affairs for correction of political abuses, though the project for studying state organizations financed by the Pack Foundation was conducted in a highly useful manner in those states which *requested* this cooperation.

It is obvious that in the field of basic policies dealing with the public (objective 3) the Council must be and has been guided by the Society membership. Referendums, initiated by the Council, were held in 1914 (Proceedings S.A.F. 9:130) endorsing certain views of Raphael Zon on "Forests and Waters in the Light of Scientific Investigations"; in 1920, on 38 proposals covering a proposed plan for forest policy and specific legislation therefor (Journal of Forestry 18:585-589); in 1924 on the McNary bill S. 1182, supported 343 to 37 (Journal of Forestry 22:341); in 1934 (Journal of Forestry 32:792) on general public policies; in 1938 on standards for national parks, national forests, and wilderness areas (S.A.F. Affairs Dec. 38:207-209) with separate votes on 17 principles; and in 1947, on multiple use (See Policies adopted by the Council and by Referendum vote of the Membership through 1947, p. 78).

Since amendments to the Constitution affecting any of its provisions, such as membership qualifications and dues, require a "referendum" or vote of the members, they need not be listed as bearing on the problem of referendums, which boils down to two questions:

1. Shall the general basic policies of the Society be decided by referendum? On this point, there has been no difference of opinion as the record shows. With one exception namely, federal regulation, all such referendums have been authorized by the Council, usually on the initiative of a society committee.

2. Shall the Council take action in support or opposition to specific legislation affecting (a) General public interests (objective 3); (b) Professional status and welfare (objective 1)? It is in this field that the Council's interpretation of the intent of Article II of the Constitution has given rise, *on two occasions only*, to an appeal against its position.

In the first instance, a specific bill was the target. After initial condemnation in 1944 of HR 1688 transferring 452,000 acres of national forest land from Agriculture to Interior (the first investigation by the Council was in 1936), the Council as previously noted split evenly in 1946 and again in 1948, the president deciding its position in each case by his vote, once against action, one for action. It was thought necessary to guide the Council by a referendum. To this, certain members violently objected and raised the entire question as to whether or not a referendum on specific legislation was permissible. This position was taken by a minority as a means to prevent action by the members on the merits of S 580 (succeeded by S 148) 81st Congress. The vote on this question was:

For holding the referendum. Yes, 1683; No, 934.

Disapproving the transfer, 2005; approving 558.

By this referendum the members by a proportion of 64 percent approved of the general principle that the Council should take action on specific legislative measures. The bill itself was condemned by a proportion of 78 percent of those voting. Except for the effort of certain members, as noted, to prevent the Council from publishing the report condemning politics in the C.C.C., in 1936 (S.A.F. Affairs June 1936: 3-4) which was defeated by a vote of 1307 to 94 and the report printed, the referendum on the O and C lands was the first that had even been initiated by petition to clarify the position of the Council on any subject involving public policy.

In only one subsequent case was a petition for a referendum presented to secure a decision binding on the Council, on a matter of disputed policy. Referendums, initiated by committees, had been held on the subject of public acquisition (10 points), 1938, and on public regulation, with many other points 1920 (Journal of Forestry 18:585). The question of whether the federal government should have the power to regulate private owners directly as incorporated in the Anderson bill (S 1820, 81st Congress, 1949) had never been submitted to the members. On the definite refusal of the president to permit the consideration of any specific bills, including this one, by the Council, or, later, to permit discussion of this bill in the JOURNAL in connection with the referendum, it became necessary to appeal the case by referendum which was done, the vote being on the general principle involved. The ballot was: Against federal regulation 2545—69.68 percent; for federal regulation 1107—30.32 percent. Following this decision the Council mailed a statement embodying it to members of Congress and to the press.

These are, as far as the writer knows, the only two referendums with the exception of the C.C.C. protest that were initiated for the guidance of the Council on public policy, by signed petitions of members. The initial provision for such referendums provided that 50 signatures were needed. The one on regulation was signed by 178 members. Following this referendum the Council secured by ballot an amendment to Article VII which provided that not less than 250 voting members, of whom at least 25 must be from each of three different Sections, are required to give the petition validity.

This amendment shall not apply to jurisdiction over cases of disciplinary action nor to administrative matters, including the appointment or dismissal of the executive secretary, on which cases the decision of the Council shall be final. This last provision was actuated by a referendum petition against the Council's action in dismissing the executive secretary, in 1937. The Council's action was sustained by a vote of 1114 to 686, which determined its administrative powers without which it could not have continued to function.

This brings the number of petitions for referendums to four. Two of these were against the president and Council for actions taken, and two were to secure action on matters of public policy, one specific, one general. The writer was concerned in each case, but initiated only the last two. Just as a matter of record therefore he was not responsible for "initiating more referendums than all the other 8,000 members put together," but this is of no consequence. What concerns him is whether the principle has or has not been established, first, that objectives 1 and 3 are the direct concern of the Council, which should take the initiative, as governed by referendums on policy; second, whether this calls for action by the Council on specific bills, and on definite situations calling for more than generalities; and third, what kind of action should be taken. So far, this action has been confined to publicizing the position of the Society. The present position of the Council is averse to taking the initiative in opposing or favoring legislation before Congress unless requested to do so by members of that body. Is this enough?

Considering the fact that only 4 petitions for referendums have been initiated during the 50 years of Society history, the writer does not agree with the provision for raising the requirements for initiating referendums, as being necessitated by undue or unjustified activities in this line by recalcitrant members seeking to embarrass the Council, and putting the Society to undue expense. But as the members approved of this constitutional provision, it is accepted.

What he would like to see in the near future is a decision to clarify the policy of the Council and Society on the following points:

1. Do objectives 1 and 3 of Article II mean that the Council shall actively favor or oppose specific proposed legislation affecting professional and/or public interests in forestry?

2. Shall this attitude be implemented by initiating appearances before Congressional committees, or on state matters, or be confined to publicity?

The writer has no intention, at present, of starting his third petition for a referendum, on this question. But he believes that there exists among members a widespread belief that the Society should be more than a mere educational and technical body, and should align itself with other professional societies such as medicine, engineering, and law, by pursuing a positive and active role in influencing legislation and administrative matters vitally affecting both its own and the public interests in forestry. He would like to see this subject discussed in Society Affairs.

H. H. CHAPMAN.

Since writing the above, my attention has been called to S 31, introduced January 8, 1951 by Senator McCarran. This bill neatly provides that hereafter no change in grazing fees shall be made by the Secretary of Agriculture within any district unless the advisory board for such district has consented to such change. If passed, the livestock men will be placed in full control of the scale of grazing fees paid by them for the use of public property. Is this specific bill one which should be opposed by the Council, or not?

H.H.C.

All Floridians Apply

All eleven of the February forestry graduates at the University of Florida applied for Junior Membership in the Society of American Foresters.

Candidates for Membership

Candidates for membership whose applications were received in the Society office prior to March 27, 1951 are listed below. Names, positions, addresses, and education are given.

Action regarding the eligibility of these candidates will be taken by the Council as of June 1, 1951. Comments, protests, or important information regarding the qualifications for membership of candidates listed are invited from present voting members. All such communications are kept strictly confidential being used only by the Council in taking final action on applications. Correspondence should be received in the Society office prior to June 1, 1951.

The names of those candidates who are elected will be published in the Society Affairs department of the July 1951 JOURNAL OF FORESTRY. The names of those who signify their acceptance of election will be published in subsequent issues of the JOURNAL.

Allegheny Section

Junior Grade

Burke, H. G., Asst. Dist. Game Mgr., Cons. Comm. of W. Va., Charleston, W. Va.; W. Va. Univ., B.S.F., 1950.

Detwiler, J. S., 515 High St., Johnsonburg, Pa.; Pa. State, B.S.F., 1950.

Hardesty, J. L., Farm Forester, Cons. Comm. of W. Va., Charleston, W. Va.; W. Va. Univ., B.S.F., 1949.

Shilling, R. E., Jr., 607 N. Walnut St., Milford, Del.; N. C. State, B.S.F., 1950.

Whitesell, C. D., Biologist, Md. Dept. of Research and Education, Solomons, Md.; W. Va. Univ., B.S.F., 1951.

Member Grade

Appler, H. M., Asst. Forester, Stokes State Forest, Branchville, N. J.; Univ. of Ga., B.S.F., 1942. (Junior, 1946).

Dietrick, A. N., Forester, Glatfelter Pulp Wood Co., La Plata, Md.; Pa. State, B.S.F., 1934. Reinstatement.

Hays, E. F., Asst. Land Agent, Pocahontas Land Corp., Pineville, W. Va.; W. Va. Univ., B.S.F., 1940. (Junior, 1947).

Young, C. A., Jr., Park Forester, Bureau of Parks, Baltimore, Md.; Pa. State, B.S.F., 1939. (Junior, 1944).

Appalachian Section

Junior Grade

Minetree, J. A., 109 Central Park, Petersburg, Va.; Univ. of Fla., B.S.F., 1950.

Member Grade

Billingsley, J. C., Cons. Forester, Newberry, S. C.; Univ. of Mich., B.S.F., 1933; M.F., 1935. (Junior, 1947).

Central Rocky Mountain Section

Junior Grade

Caudill, R. L., Range Cons. Aide, U. S. Bureau of Land Mgmt., Lander, Wyo.; Colo. A & M., B.S.F., 1950.

Morton, A. D., Forester, U.S.F.S., Englewood, Colo.; Colo. A & M., B.S.F., 1940; Univ. of Idaho; M.S., 1950.

Stadler, G. S., City Forester, Denver, Colo.; Colo. A & M., B.S.F., 1932. Reinstatement.

Member Grade

Fillas, T. J., Lbr. Jobber, Denver, Colo.; Colo. A & M., B.S.F., 1940; Duke Univ., M.F., 1941. (Junior, 1946).

Merkel, E. P., Entomologist, Forest Insect Lab., Fort Collins, Colo.; N. Y. State, B.S.F., 1946. (Junior, 1948).

Mogren, E. W., Instructor, Colo. A & M., Fort Collins, Colo.; Univ. of Minn., B.S.F., 1947; M.F., 1949. (Junior, 1949).

Woodward, H. R., State Forester, S. Dak. Dept. of Game, Fish and Parks, Pierre, S. Dak.; Utah State, B.S.F., 1941. (Junior, 1946).

Central States Section

Junior Grade

Beacom, W. A., 1331 Springfield, Willow Run, Mich.; Univ. of Mich., B.S.F., 1949; M.F., 1950.

Brickman, T. L., Forester, Hawkins Lbr. Co., Rollin, Mich.; Mich. State, B.S.F., 1950; M.F., 1950.

Jaskulski, T. M., Laborer, Cook County Forest Preserve, River Forest, Ill.; Iowa State, B.S.F., 1951.

Metcalf, W. B., Research Forester, U.S.F.S., Columbus, Ohio; Univ. of Mo., B.S.F., 1949.

Olson, P. L., Fire Control Aide, U. S. National Park Service, Cambridge, Ill.; Iowa State, B.S.F., 1950.

Williams, C. R., Laborer, Dow Chemical Co., Midland, Mich.; Univ. of Mich., B.S.F., 1950.

Columbia River Section

Junior Grade

George, G. W., Box 106, Bend, Oreg.; Oregon State, B.S.F., 1951.

Schaefer, R. E., Forester, J. Herbert Bate Co., Wallowa, Oreg.; Univ. of Minn., B.S.F., 1949.

Stoebig, R. W., Forester, Tree Farm Management Service, Eugene, Oreg.; Oregon State, B.S.F., 1941.

Wilson, O. E., Lbr. Student, Long-Bell Lbr. Co., Longview, Wash.; Univ. of Mo., B.S.F., 1950.

Member Grade

Carmean, W. H., Research Forester, Pac. N. W. Forest Exp. Sta., Portland, Oreg.; Pa. State, B.S.F., 1943; Duke Univ., M.F., 1947. (Junior, 1945).

Gilmor, L. G., Dist. Rgr., U.S.F.S., Unity, Oreg.; Univ. of Wash., B.S.F., 1941. (Junior, 1946).

Phelps, W. S., Tech. Asst., Oregon State Board of Forestry, Salem, Oreg.; Oregon State, B.S.F., 1942. (Junior, 1947).

Yeater, R. F., Farm Forester, Oregon State Board of Forestry, Salem, Oreg.; Oregon State, B.S.F., 1941. (Junior, 1947).

Gulf States Section

Junior Grade

Burnham, J. W., 1221 S. Seventeenth Ave., Laurel, Miss.; A.P.I., B.S.F., 1951.

Christopher, J. F., Research Forester, U.S.F.S., New Orleans, La.; A.P.I., B.S.F., 1948.

Holman, J., Area Forester, Richton Tie and Tbr. Co., Morton, Miss.; La. State Univ., B.S.F., 1948; Duke Univ., M.F., 1949.

Kennedy, T. B., Head Scaler Int. Paper Co., Buchtunna, Miss.; A.P.I., B.S.F., 1950.

McDonald, D. E., Jr., Tbr. Cruiser, Hercules Powder Co., Hattiesburg, Miss.; Univ. of Ga., B.S.F., 1940.

McElwee, R. L., Asst. Mgmt. Forester, Gaylord Container Corp., Bogalusa, La.; W. Va. Univ., B.S.F., 1951.

Winter, E. H., Asst. Mgmt. Forester, Gaylord Container Corp., Bogalusa, La.; Iowa State, B.S.F., 1950.

Member Grade

Mattson, C. D., Forester, Mansfield Hardwood Lbr. Co., Winnfield, La.; Univ. of Mich., B.S.F., 1941. (Junior, 1946).

Associate Grade

Spears, R. K., Assoc. Prof. of Botany and Forestry, Centenary College of Louisiana, Shreveport, La.; Okla. A & M., B.S., (Botany and Plant Path.), 1941; La. State, M.S., (Botany and Plant Path.), 1947.

Inland Empire Section

Junior Grade

Mobley, N. F., Forester, Potlatch Forests, Headquarters, Idaho; Univ. of Mo., B.S.F., 1950.

Stratton, H. W., Forester, U.S.F.S., Coeur d'Alene, Idaho; Mont. State, B.S.F., 1949; M.F., 1950.

Thaanum, R. F., Forester, U.S.F.S., St. Maries, Idaho; Univ. of Wash., B.S.F., 1940.

Wentworth, I., Sales Mgr., Northwest Timber Co., Gibbs, Idaho; Univ. of Idaho, B.S.F., 1947.

Member Grade

McKahan, J. H., Asst. Mgr., Northwest Tbr. Co., Gibbs, Idaho; Univ. of Idaho, B.S.F., 1947. (Junior, 1948).

Affiliate Grade

Harshman, E. P., Forestry Aide, Northern Rocky Mt. Forest and Range Exp. Sta., Spokane, Wash.; Wash. State, B.S.A., 1951.

Kentucky-Tennessee Section

Junior Grade

Mansberger, B. E., 6 Gay St., Winchester, Ky.; Pa. State, B.S.F., 1922.

New England Section

Junior Grade

Cunningham, P. H., 16 Church St., Calais, Me.; Univ. of Me., B.S.F., 1951.
McAvoy, T. F., Jr., 47 Gray St., Amherst, Mass.; Univ. of Mass., B.S.F., 1950.

New York Section

Junior Grade

Hamilton, L. S., Asst. Prof., N. Y. State College of Agric., Ithaca, N. Y.; Univ. of Toronto, B.S., (Forestry), 1948; N. Y. State, M.F., 1950.
MacLean, C. D., 15 Miner St., Canton, N. Y.; Univ. of Me., B.S.F., 1950.

Affiliate Grade

Hanlon, J. A., Forest Foreman, N. Y. State Cons. Dept., Lowville, N. Y.; N. Y. State (3 yrs.).

Northern California Section

Junior Grade

Faulkenberry, V. T., U. S. Navy, San Francisco, Calif.; Univ. of Mo., B.S.F., 1950.

Affiliate Grade

Siler, W., State Forest Rgr., State Div. of Forestry, Fortuna, Calif. Reinstatement.

Northern Rocky Mountain Section

Junior Grade

Hughes, D. T., 901 E. Park St., Butte, Mont.; Mont. State, B.S.F., 1950.

Member Grade

Frey, R. E., Forester Adm., U.S.F.S., Noxon, Mont.; Univ. of Idaho, B.S.F., 1938. (Junior, 1945).
Mart, R. M., Dist. Forest Rgr., U.S.F.S., Lima, Mont.; Mont. State, B.S.F., 1940. (Junior, 1947).

Affiliate Grade

Shaw, C. S., Dist. Rgr., Flathead Nat'l. Forest, Kalispell, Mont.

Ozark Section

Junior Grade

Liechti, W. M., 2703 E. 35th St., Kansas City, Mo.; Univ. of Mo., B.S.F., 1950.
Purcell, W. W., Compassman, Int. Paper Co., Sheridan, Ark.; Univ. of Mo., B.S.F., 1950.

Puget Sound Section

Junior Grade

Johnson, A. L., U.S.F.S., Juneau, Alaska; Pa. State, B.S.F., 1951.
Klein, J. A., Forester, Alaska Forest Research Center, Juneau, Alaska; Univ. of Wash., B.S.F., 1950.
Long, F. W., Dist. Forest Warden, State Div. of Forestry, Raymond, Wash. (Affiliate, 1947).
Seiser, V. O., Land Economist, Bur. of Land Mgmt., Anchorage, Alaska; Iowa State, B.S.F., 1947.

Southeastern Section

Junior Grade

Albrecht, F. J., Cons. Forester, Int. Paper Co., Albany, Ga.; La. State, B.S.F., 1949.
Anderson, C. W., 216 Margaret St., Jacksonville Beach, Fla.; Univ. of Fla., B.S.F., 1951.
Chandler, J. H., Forester, G. B. Larimer, Millhaven, Ga.; Univ. of Ga., B.S.F., 1949.
Chellman, C. W., 7756 N. W. Ninth Ave., Miami, Fla.; Univ. of Fla., B.S.F., 1951.
Dumas, K. M., Jr., Cons. Tech., Inst. Paper Co., York, Ala.; A.P.I., B.S.F., 1950.
Gilmore, A. R., Instructor, Univ. of Fla., Gainesville, Fla.; Univ. of Fla., B.S.F., 1949; Duke Univ., M.F., 1950.
Harris, G. M., Univ. of Fla., Gainesville, Fla.; Univ. of Fla., B.S.F., 1951.
Johnson, C. D., 175 N. 59th St., Miami, Fla.; Univ. of Fla., B.S.F., 1951.
Jones, D. E., Box 116, Vernon, Fla.; Univ. of Fla., B.S.F., 1946.
Kelley, E. L., Jr., Box 141, Lake Butler, Fla.; Univ. of Fla., B.S.F., 1951.
Kilburn, J. R., Florence, Ala.; A.P.I., B.S.F., 1951.
Newman, T. J., Box 136, Cullman, Ala.; A.P.I., B.S.F., 1951.
Pearce, N. D., Hamilton, Ala.; A.P.I., B.S.F., 1951.
Reed, A. V., Tbr. Estimator, Tenn. Coal, Iron and Railroad Co., Birmingham, Ala.; Newberry College, A.B., 1939; Duke Univ., M.F., 1948.
Saults, R. W., Jr., Box 35, Yankeetown, Fla.; Univ. of Fla., B.S.F., 1951.
Taylor, J., Forester, Cook and Co., Hazlehurst, Ga.; Univ. of Ga., B.S.F., 1949. Reinstatement.
Vessels, J. L., 202 E. Brown St., Lake City, Fla.; Univ. of Fla., B.S.F., 1951.
Weybrecht, P. W., Jr., Box 116, Bonifay, Fla.; Univ. of Fla., B.S.F., 1951.

Member Grade

Davisson, R. W., Cons. Forester, Harlem, Ga.; Univ. of Ga., B.S.F., 1936. (Junior, 1936).
Hale, J. P., Jr., Local Mgr., La Floresta Perdida, Inc., Bay Springs, Fla.; Univ. of Ga., B.S.F., 1933. (Junior, 1944).
Steensland, M. J., Dist. Forester, Div. of Forestry, Montgomery, Ala.; Univ. of Minn., B.S.F., 1940. (Junior, 1947).

Affiliate Grade

Haskins, N. H., Field Asst., Forest Farmers Assoc. Coop., Valdosta, Ga.; L.P.I., B.S.F., 1950.
Loper, L. L., Asst. Forester, Tenn. Coal, Iron and Railroad Co., Helena, Ala.

Southern California Section

Member Grade

Janes, R. C., Fire Control Aide, U.S.F.S., Maricopa, Calif.; Univ. of Calif., B.S.F., 1947. (Junior, 1947).

Southwestern Section

Junior Grade

Holmes, W. L., Forester, U.S.F.S., Flagstaff, Ariz.; Colo. A & M., B.S.F., 1950.
Reynolds, H. C., Forester, U.S.F.S., Flagstaff, Ariz.; Colo. A & M., B.S.F., 1949.
Richardson, F. H., Forestry Aide, U.S.F.S., Flagstaff, Ariz.; La. State, B.S.F., 1950.

Member Grade

Wallace, S., Forester, U.S.F.S., Silver City, New Mex.; Colo. Agric. College, A.B., 1935. (Junior, 1947).

Affiliate Grade

Bassler, C. D., Forestry Aide, U.S.F.S., Flagstaff, Ariz.
Lebach, B. D., Forestry Aide, Sitgreaves Nat'l. Forest, Winslow, Ariz.

Upper Mississippi Valley Section

Junior Grade

Dickinson, S. K., Forester, Iron Range Resources and Rehabilitation, Hibbing, Minn.; Univ. of Minn., B.S.F., 1949; N. Y. State, M.F., 1950.
Eschner, A. R., Research Grad. Asst., Iowa State College, Ames, Iowa; N. Y. State, B.S.F., 1950.
Huston, R. G., Forestry Aide, U.S.F.S., Duluth, Minn.; Univ. of Minn., B.S.F., 1950.
Rowe, R. W., Forester, Iron Range Resources and Rehabilitation Comm., Hibbing, Minn.; Univ. of Minn., B.S.F., 1950.

Member Grade

Huntley, P. L., Forester, Kimberly Clark Corp., Duluth, Minn.; Univ. of Minn., B.S.F., 1939. (Junior, 1946).
McKenna, N. J., Asst. Rgr., North Star Tbr. Co., Duluth, Minn.; Univ. of Minn., B.S.F., 1931. (Junior, 1947).

Washington Section

Junior Grade

Hair, D., Forester, U.S.F.S., Washington, D. C.; Univ. of Mich., B.S.F., 1949; A.M., 1950.

Member Grade

Gregg, H. R., Chief Naturalist, National Capital Parks, Washington, D. C.; Hendrix College, A.B., 1927. (Junior, 1946).

Wisconsin Upper Michigan Section

Junior Grade

Christianson, E. M., 1221 E. Main St., Merrill, Wis.; Univ. of Minn., B.S.F., 1950.

Foreign

Junior Grade

Lyons, T. F., Planter, Firestone Plantations Co., Cape Palmas, Liberia, West Africa; Mich. State, B.S.F., 1949.

Member Grade

Swenson, G. W. P., Asst. Mgr., Empresa di Servicios Agricolas Mecinazados, Guayaquil, Ecuador; N. Y. State, B.S.F., 1938; Yale, M.F., 1939.

Candidates Elected

The following persons were elected to the indicated grades of membership by the Council on April 1, 1951.

Junior Grade

Babbitt, D. S.
Bailey, H. B., Jr.
Barclay, W. H.
Barrett, C. D.
Bartley, W. G.
Bayless, B. J.
Beall, J. W.
Besse, J. D.
Brank, G. P.
Branyan, H. L.
Branyan, W. C.
Brightwell, C. N.
Brown, C. W.
Bullock, W. R., Jr.
Byrd, N. A.
Carlson, B. D.
Chabbott, G. H.
Creighton, D. G.
Crenshaw, M. E.
Crider, J. M., Jr.
Corrick, E. B.
Davis, W. H.
Dawson, A. L.
Dellinger, J. C.
Elliott, J. R.
Engel, E. J.
England, C. D.
Engstrom, G. E., (re)
Evans, W. B., Jr.
Fitch, H. E.
Force, N. F., (re)
Forsyth, E. W.
Francis, J. B.
Furr, W. C.
Gardner, N. B.
George, H. H.
Gill, J. M.
Gustafson, R. E.
Hadacek, A. F.
Hagar, R. K.
Hallinan, J. P.
Hancock, J. H.
Hannon, L. P.
Harmon, J. B., III
Harris, R. C.
Hass, G. E.
Haupt, H. F.
Hix, S. P.
Hubbard, F. W., Jr.
Hughes, D. C.
Jefferies, R. H.
Jetley, M. A.
Jordahl, H. C.
Kelly, T. H., Jr.
Kinchen, R. E.
Knechtel, W. C.
Knouse, H., Jr.
Laurent, T. H.
Lecheler, L. E.
Lorentzen, F., Jr.
Martin, C. H., Jr.
McKinsey, R. A.
Miller, R. M.
Miniutti, V. P.
Moore, E. O.
Moore, L. C.
Nelson, W. R.
Olson, N. I.
Padgett, J. R.
Peery, G. W.
Phillips, H. L.
Randall, W. R.
Rausch, T. J.
Reddish, V. R.
Riley, O. L.
Roseboom, W. B.
Smith, J. E.
Soderling, D. E.
Stevens, C. M.
Steigerwalt, M. A.
Sweeley, J. P.
Wing, M. R.

Member Grade

Andersen, H. E.
Arnold, H. L.
Barber, M. F.
Beaty, W. R.
Belehrad, L. W.
Billings, S. T.
Blatt, J. A.
Boice, L. M.
Boy, G. L.
Bruce, R. I.
Burnett, T. S.
Call, F. M.
Carter, L. A., (re)
Chester, C. E.
Clifton, T. C.
Cockroft, R. S.
Cutler, V. H.
Davis, J. F.
Douglass, R. S.
Ellenberg, E. G.
Ellis, E. L.
Ellis, W. J., Jr.
Emerson, J. W.
Fletcher, P. W., (re)
Gannaway, J. C.
Gansberg, W. O.
Gessel, S. P.
Gibson, R. C.
Greco, V. A.
Griffin, W. F.
Guilkey, P. C.
Guyon, D. A.
Gynn, J. C.
Haligan, J. V.
Harr, H. M.
Hartrick, G. D.
Hicks, L. E.
Hill, L. O.
Hoelscher, L. B.
Hopkins, D. R.
Johnson, F. M.
Lewis, C. H.
Licke, J. N.
Maines, J. T.
Mathers, W. G.
Matson, R.
Maycock, C. P.
McCullough, R. N.
Merrill, J. H., (re)
Molberg, J. M.
Moore, K. E.
Moore, L. H.
Morrill, W. M.
Neff, P. E.
Nelson, R. F.
Newman, S. A.
Nixon, H. O.
O'Brien, D. E.
O'Leary, J. E.
Oliver, H. R.
Peick, C. F.
Peterka, M. J.
Phocnix, W. B.
Place, C. M.
Prater, J. D.
Quillinan, A. R.
Rau, G. J.
Rhody, J. P.
Ridgeway, J. W.
Ritzheimer, E.
Robinson, J. T.
Robinson, J. C.
Rochelle, E. B.
Rogers, J. L.
Rommel, S. S.
Rowson, L.
Rushmore, F. M.
Sartz, R. S.
Scott, D. R. M.
Seagle, W. D.
Seymour, L. H.
Shaw, E. W.
Simpson, L. L.
Skarra, R. E.
Smart, R. A.
Stewart, L. L.

Stout, N. J.
Strout, D. F.
Surdam, E. L.
Thomson, G. W.
Usenik, F. A.
Venator, J. D.
Watkins, A. G.
West, W. E.
Wilton, E.
Withee, O. M.
Yocom, T. R.

Affiliate Grade

Ingram, O. A.
Fraser, A. F.
Gotcher, J. T.
Kurz, J. Q.
MacPherson, G. A., (re)
Porter, W. A.
Scalf, R. A.
Schwartz, C. M.

Associate Grade

Bennett, H. D.

Corresponding Grade

Ito, Mitsugu

New Members and Advancements

The new members and members who have been advanced in grade who are listed below are eligible for participation in activities of the Society of American Foresters, including the meetings and projects of Sections, Chapters, Divisions, and Committees. They have submitted their applications for membership, properly endorsed, and have been declared eligible by the Council. By accepting election, these members have indicated their desire to assist the Society in the fulfillment of its objectives.

Allegheny Section

Student Grade

PENNSYLVANIA STATE COLLEGE

Enos, J. J.
Landon, P. F.
Shogren, P. W.

WEST VIRGINIA UNIVERSITY

Craft, E. P.
Crosby, M. R.
Gillespie, W. H.
Jenkins, E. P.
Looney, J. F.
Matics, H. E.
Moore, R. A.
Ogden, E. P.
Sohaney, A. L.
Sweetland, T. W.
Toler, B.
Underwood, E. H.
Westfall, C. Z.

Junior Grade

Banks, W. G., 102 Motors Ave., Upper Darby, Pa.
Eastman, J. T., Panther State Forest, Panther, W. Va.
Howard, G. P., Jr., Annandale, N. J.
Thomas, E. A., Jr., Box 367, Hamlin, W. Va.

Member Grade

Atkinson, S. G., Huntingdon Valley, Pa.
Bamford, G. T., State House Annex, Trenton, N. J.
Byers, J. B., Morgantown, W. Va.
Carpenter, C. H., Lock Haven, Pa.
Kemper, R. C., Fayetteville, W. Va.
Melton, R. E., Mont Alto, Pa.
Myers, C. A., Jr., 321 Riverview Ave., Morgantown, W. Va.
Osterhout, E. J., 1915 Bower Hill Rd., Pittsburgh, Pa.

Appalachian Section

Student Grade

NORTH CAROLINA STATE COLLEGE

Beaman, J. H.
Cousins, C.
Estep, E. M.
Etchison, P. B.
Garrett, H. R.
Gentry, B. W.
Greenwood, L. D.
Hance, J. T.
Lamb, G. E.
Penland, R. F.
Reid, J. R., Jr.
Scholtes, W. E.
Westbury, H. M.
Willoughby, C. C.

Junior Grade

Durant, M. N., Box 392, Altavista, Va.
Holland, J. C., 20 S. Third St., Wilmington, N. C.
Morris, W. E., Lake Waccamaw, N. C.

Member Grade

Chamblee, G. V., Denbirgh, Va.
Custer, S. A., 244 Gilbert St., Hampton, Va.
Fortgang, D., Conway, S. C.
Hubbard, J. B., 3036 Churchill Rd., Raleigh, N. C.
Jaenicke, R. W., 901A Fair St., Camden, S. C.
Johnson, R. S., McNair Investment Co., Laurinburg, N. C.
Jolley, T. M., Box 883, Summerville, S. C.
Larson, R. W., 23 Wildwood St., Asheville, N. C.
Wolcott, R. W., International Paper Co., Raleigh, N. C.

Central Rocky Mountain Section

Student Grade

COLORADO A & M COLLEGE

Belt, R. S.
Berndt, H. W.
Binford, B.
Brown, D. L.
Bryan, W. J.
Davidson, A. C.
Foster, A. L.
Hamerski, F. D.
Marti, D. W.
Schoening, J. R.
Stithem, J. K.
Tidball, R. R.

Junior Grade

Grubb, J. E., Box 147, Loveland, Colo.

Central States Section

Student Grade

MICHIGAN STATE COLLEGE

Campbell, R. L.
Cundy, C. Y.
Harris, R. L.
Kinsman, E. J.
Klein, P. L.
Martindale, D. L.
Mason, R. L.
Miracle, K. R.
Mueller, C. A.
Noblet, J. C.
Sandhusen, W. H.
Sterling, H. D.
Stevens, G. M.
Strang, J. H.

UNIVERSITY OF MICHIGAN

Bassett, J. R.
Bernardin, P. E.
Borden, M. E., Jr.
Bulgrin, E. H.
Carbaugh, P. M.
McGregor, R. C.
Merrill, H. C.
Vander Cook, L. S.

PURDUE UNIVERSITY

Amchein, G. C.
Barnett, D. A.
Blickenstaff, B. S.
Crabb, J. N.
Croxton, R. J.
Davis, H. O., Jr.
Devers, C. S.
Draper, L., Jr.
Finger, G. P.
Francisco, G. M.
Funk, D. T.
Gordon, S. M.
Johnson, F. H.
Kleineyer, J. L., III
Kolger, W. A.
Lahr, J. D.
McGregor, D. C.
Meso, S. W.
Miller, L. W.
Morrett, C. M.
Myers, P. M.
Nordli, R. C.
Ober, M. O.
Pickerl, L. C.
Prentice, W. W.
Pruett, E. W.
Rinehart, D. W.
Smith, R. M.
Steiner, J. P.
Wengert, R. H.
Wilkinson, W. B.

Junior Grade

Broomall, C. O., 1337 N. Huey St., South Bend, Ind.
Conklin, L. D., 134½ 7th St., Freeland, Mich.
Hager, J. W., 212 Lovell St., Elgin, Ill.
Jones, T. R., 4217 Sheridan Rd., Youngstown, Ohio.
Johnson, D. L., Ossineke, Mich.
Kageorge, M. W., 631 Deerfield Ave., Highland Park, Ill.
Meredith, D. W., Alma, Mich.
Williams, W. K., 707 Cronkright St., Midland, Mich.

Columbia River Section

Student Grade

OREGON STATE COLLEGE

Abrahamson, R. E.
Andringa, J. J.
Bates, S. J.
Caragozian, J. L.
Coffell, D. G.
Cole, R. M.
Collins, D. H.
Duysen, G. H.
Eckstrom, T. F.
Goodrich, D. S.
Gould, N. E.
Jones, W. V.
Kistner, D. R.
Litten, G. W.
Mitchell, H. W.
Moore, F. W.
Mosar, M. A.
Schappell, J. N.
Schrager, M. H.
Theuerkauf, E. H.
Thomas, V. D.
Williams, D. N.

Junior Grade

Abraham, D. B., Blue River, Oreg.
Black, E. D., 425 E. Cass St., Roseburg, Oreg.
Davison, A. T., 445 U. S. Court House, Portland, Oreg.
Falconer, P. W., W. Maple Terrace, Longview, Wash.
Jennings, W., Jr., U.S.F.S., Disston, Oreg.
Miller, J. G., 966 S. First St., Coos Bay, Oreg.
Schmidt, F. F., Box 231, Roseburg, Oreg.
Sorseth, A. L., U.S.F.S., Detroit, Oreg.
Willey, R. M., Box 97, Butte Falls, Oreg.

Member Grade

Bronson, V. D., 301 Bushnell Lane, Eugene, Oreg.
Elmgren, R. C., 26 Portland Ave., Medford, Oreg.
Hobbs, R. L., 423 U. S. Court House, Portland, Oreg.
Jester, C. M., Florence, Oreg.
Lindsay, R. C., Box 71, Vernonia, Oreg.
Murnen, E. J., Jr., Sutherlin, Oreg.
Templin, R. L., Jr., Selma, Oreg.
Tippner, E., 300½ N. Long Ave., Kelso, Wash.
Vance, P. N., St. Helens, Oreg.

Gulf States Section

Student Grade

LOUISIANA STATE UNIVERSITY

Coltharp, G. B.
Edgington, R. C.
Huff, P. R.

Junior Grade

Hong, C. A., Jr., 5737 Penrose, Dallas, Tex.
LeBlanc, W. J., Box 35, Ponchatoula, La.
Lowery, D. P., Stephen F. Austin State College, Nacogdoches, Tex.
Powell, D. H., 203 Lampkin St., Starkville, Miss.

Member Grade

Buescher, P. P., Box 125, Bentonia, Miss.
Dedeaux, R. J., Box 52, Perkinston, Miss.
Jones, M. S., Jr., Woodward-Walker Lbr. Co., Taylor, La.
Lange, R. W., Box 691, Jena, La.
Miller, I. W., U.S.F.S., Oxford, Miss.
Weatherly, J. E., Jr., Jackson, Miss.

Inland Empire Section

Junior Grade

Darrach, A., Headquarters, Idaho
Ringold, G. B., Box 655, Bonville, Idaho
Martin, J. W., 200 Euclid Ave., Sandpoint, Idaho

Intermountain Section

Student Grade

UTAH STATE AGRICULTURAL COLLEGE

Bones, W. F., Jr.
Craine, M. E.
Cusaman, H.
Kearns, F. W.
May, W. T.
McElroy, H. D.
Rickman, S. H.
Shilling, G. E.

Junior Grade

Badertscher, R. L., Box 145, Eureka, Utah
Hunter, D. B., Headquarters, Idaho
Johnson, T. J., 1925 Yellowstone Ave., Idaho Falls, Idaho

Member Grade

Roberts, A. M., Box 267, McCall, Idaho
Tucker, B. H., U.S.F.S., Cedar City, Utah

Kentucky-Tennessee Section

Junior Grade

Whipkey, R. Z., U. S. Army, Fort Knox, Ky.

New England Section

Student Grade

UNIVERSITY OF MAINE

McLeary, F. J.

YALE UNIVERSITY

Arnold, P.
Coachman, L. K.
Dimock, E. J.
Eisenmenger, R. W.
Gould, W. P.
Haines, W. H.
Page, D. S.
Smith, H. W., Jr.
Thompson, T. A.

Junior Grade

Lindahl, R. R., 51 Hillhouse Ave., New Haven, Conn.

Member Grade

Bourget, A. M., 30 Ave. des Braves, Quebec, Canada
Bush, H. H., U.S.F.S., Middlebury, Vermont
Cowan, F. W., Box 122, W. Stewartstown, N. H.
Olmsted, N. W., Box 72, Livermore Falls, Me.
Pendleton, R. E., Island Falls, Me.
Rand, C. W., 83 Spring St., Berlin, N. H.
Stankiewicz, M. J., 33 Fifth St., Berlin, N. H.

New York Section

Student Grade

STATE UNIVERSITY OF NEW YORK

Condron, T. H.
Emond, R. J.
Epstein, E.
Jensen, A. C.
Lanner, R. M.
Lock, R. H.
McConnell, J. M.
McGann, J. R.
Nichols, J. O.
Webster, H. H.

Junior Grade

Burns, R. M., 2896 Heath Ave., New York, N. Y.
Giaquinto, E. J., 515 McDonald Ave., Brooklyn, N. Y.

Johnson, G. L., Box 83, Ithaca, N. Y.
Kingston, J. T. B., State Univ. of N. Y., Syracuse, N. Y.
Kovner, J. L., 3 Crawford St., Syracuse, N. Y.

Member Grade

Farrell, J. H., 72 Park Ave., Saranac Lake, N. Y.
Harrison, J. D. B., Dept. of Resources and Dev., Ottawa, Can.
Love, D. V., Faculty of Forestry, Univ. of Toronto, Toronto, Can.
Phillips, J. E., Box 784, Berlin, N. Y.

Northern California Section

Student Grade

UNIVERSITY OF CALIFORNIA

Andrews, W. B., Jr.
Ashby, V. W.
Bash, D. R.
Berridge, R. D.
Biddison, L. R.
Blunt, E. F.
Bolster, W. R.
Burtchett, G. W.
Chandler, C. C.
Crebbin, P. E.
Gavin, W. H.
Graham, H.
Griffin, J. R.
Griffin, J. P.
Hall, G. H., Jr.
Hallett, A. F., Jr.
Hart, J. E.
Helm, R. E.
Helsing, R. E.
Hope, D. G.
Kay, B. L.
Marsh, L. W., Jr.
McCluskey, G. E.
McDonald, D.
Miner, R. W., Jr.
Munnich, K. A. C.
O'Kelly, T. J.
Poppe, C. R., Jr.
Rehbein, D. A.
Robinson, G. P.
Smart, E. F.
Smith, V. E.
Stark, K. S.
Steed, G.
Stroupe, H. I.
Tutton, T. A.

Junior Grade

Curry, W. L., 2019 46th Ave., Oakland, Calif.
Dunn, G. A., 647 Redwood Ave., Corte Madera, Calif.
Furniss, M. M., 2025 Durant Ave., Berkeley, Calif.
Jacobson, C. H., U.S.F.S., Mt. Hebron, Calif.
Lendman, F. N., Box 27, Westwood, Calif.
Scott, E. L., 315 Del Norte St., Eureka, Calif.
Watson, H. O., Jr., 2969 Calif. St., Eureka, Calif.

Member Grade

Kaufner, H. B., Box 959, Redding, Calif.
Larson, J. E., 2316 Capital Ave., Sacramento, Calif.
Marshall, L. T., c/o Dolly Varden Lbr. Co., Arcata, Calif.
Miller, H. B., Box 98, Covelo, Calif.
Roy, D. F., Box 245, Berkeley, Calif.

Affiliate Grade

Rosar, J. F., Box 15, Cathay, Calif.

Associate Grade

Wilsey, L., Blagan Lbr. Co., White Pines, Calif.

Northern Rocky Mountain Section

Student Grade

MONTANA STATE UNIVERSITY

McCue, R. H.
Terry, D. C.

Ozark Section

Student Grade

UNIVERSITY OF MISSOURI

Coplen, W. C.
Ducsing, R. C.
Ferguson, A. C.
Grate, D. A.
Greer, W. T.
Schock, J. H.
Steger, P. J.

Junior Grade

Paulsell, L. K., Weldon Spring Exp. Farm, Weldon Spring, Mo.

Member Grade

Burleigh, C. A., Crossett Lbr. Co., Crossett, Ark.
Danson, R. O., Licking State Nursery, Licking, Mo.
Johnson, H. E., Sheridan, Ark.
Williston, H. L., Box 272, Crossett, Ark.

Puget Sound Section

Student Grade

UNIVERSITY OF WASHINGTON

Bailey, E. E.
Carlson, D. R.
Clocksin, D. B.
Cook, W. B.
Gockerell, E. C.
Heath, E. H.
Herold, J. H.
Hill, J. L.
Johnson, R. E.
Keller, L. R.
Larson, A. G.
Morgan, D. W.
Oldroyd, R. W.
Ostrowski, P. F.
Pierce, J. R.
Poe, C. M.
Powell, A. W.
Rising, R. P.
Rouse, W. R.
Sharpe, G. W.
Spencer, L. D.
Strand, R. F.
Summerfield, E. R.
Tanner, R. S.
Tindall, R. W.
Turner, W. H.
Vogel, D.
West, R. A.
Zeller, R. E.
Zepeda, H. A.

Junior Grade

Bevan, J. S., 1133 33rd Ave., N., Seattle, Wash.

Member Grade

Buckland, D. C., Univ. of B.C., Vancouver, B. C.

Southeastern Section

Student Grade

UNIVERSITY OF FLORIDA

Burton, R. P., Jr.
Willis, R. O.

UNIVERSITY OF GEORGIA

Alford, C. E.
Arnette, T. E.
Carter, V. E.
Craven, F. E.
Dean, C.
Gray, J.
Green, J. S.
Griffin, H. J.
Hargraves, J. F., Jr.
Hedden, R. E.
Huntemann, J. W.
Hutchinson, E. L.
James, K. E.
Mabe, W. G.
Mahany, H. J., Jr.
McLeod, C. J.
Mordecai, C. R., Jr.
Murray, B. R.
O'Leary, D. F.
Peterson, D. W.
Preston, D. N.
Ryder, J. D., Jr.
Smith, G. C.
Swilley, J. W., Jr.
Utsey, A. L.
Williams, O. L.
Wooten, R. F.

Junior Grade

Arnold, B. L., Jr., 2113 Richmond Ave., Augusta, Ga.
Broadwell, W. C., Box 4, Woodbine, Ga.
Collier, M. L., 542 S. Columbia St., Lake City, Fla.
Craft, E. J., Box 739, Ocala, Fla.
Frese, R. B., Box 2232, Spring Hill, Ala.
Haynes, J. A. W., Box 304, Butler, Ala.
Lanier, J. W., III, Box 447, Lake City, Fla.
Locke, W. J., 218 Anthony Rd., Ocala, Fla.
Misa, F. U. S. Army, Camp Gordon, Ga.
Sellers, W. J., Baxley, Ga.
Thompson, P. M., Jr., 310 Forest Hills Apts., Augusta, Ga.

Southern California Section

Junior Grade

Cermak, R., 2308 Granger Ave., National City, Calif.
Ebnet, J. M., 629 S. Broadway, Redondo Beach, Calif.

Southwestern Section

Junior Grade

Gossard, D. C., Heber Ranger Sta., Holbrook, Ariz.
Lamb, A. J., 34 C, Clark Homes, Flagstaff, Ariz.

Upper Mississippi Valley Section

Student Grade

IOWA STATE COLLEGE

Beavin, M. J.
Campbell, D. C.
Haas, R. E.
Hansen, N. J.
Hubbard, A. C.
Jensen, A. W.

UNIVERSITY OF MINNESOTA

Benson, H. W.
Blinks, S. E.
Brown, B. A.
Coates, H. W.
Findell, V. E.
Kipp, P. R.
Kopecky, F. J.
Lundgren, A. L.
Oliver, W. D.
Peterson, D. W.
Plourde, W. L.
Prauss, R. L.
Roder, D. C.
Sliney, W. J., Jr.
Sterle, J. R.
Sundin, P. A.
Wells, D. P.

Junior Grade

Carlson, R. W., 3016 Colfax Ave., S., Minneapolis, Minn.
Larson, P. R., North Branch, Minn.

Member Grade

Ryan, J. C., Makinen, Minn.
Start, W. D., 360 8th Ave., S., Ontario, Can.

Affiliate Grade

Hopia, B., Warroad, Minn.

Washington Section

Junior Grade

Quillinan, A. R., 3317-A Croffutt Place, S. E., Washington, D. C.

Member Grade

Tribbett, C. A., Rm. 5557, Interior Bldg., Washington 25, D. C.

Wisconsin-Upper Michigan Section

Junior Grade

Paull, J. T., 404 E. John St., Newberry, Mich.

Member Grade

Argetsinger, L. M., 901 Higgins Ave., Neenah, Wis.
Kolbe, R. M., Box 306, Laona, Wis.
Martin, J. V., 303 W. Prospect St., Rhinelander, Wis.
Steigerwaldt, E. F., Forest Protection Headquarters, Tomahawk, Wis.
Suominen, R. A., Loretta, Wis.
Switzer, A. L. K., Longlac, Ontario, Can.
von Dahlin, M., Rt. No. 1, Eagle, Wis.
Welsh, S. W., Wisconsin Cons. Dept., Madison, Wis.

Forestry News

Horace Justin Andrews (1892-1951)

Horace J. Andrews of Portland, Oreg., regional forester of the U. S. Forest Service's Pacific Northwest Region, was killed in an automobile accident in Fairfax County, Va., on March 23. He had gone to Washington, D. C., to attend a conference of regional foresters and experiment station directors.

He was born October 31, 1892 at Sidnaw, Mich. A forestry graduate of the University of Michigan in 1916, he was instructor in forestry at the university for three years following graduation with time out for service in the Aviation Corps of the Army in 1918. He also taught forestry at Iowa State College, then in 1924 became director of the Land Economic Survey for the Michigan Department of Conservation, serving in that capacity until 1927 when he was appointed assistant state forester and chief forest fire warden for the state.

HORACE J. ANDREWS

In 1930 Mr. Andrews joined the U. S. Forest Service as director of the forest survey of Washington and Oregon with headquarters at the Pacific Northwest Forest Experiment Station, Portland, Oreg. He remained there until 1938 when he returned to Michigan as research professor in wild land utilization at the university. In 1939 he went back to the Forest Service at Portland as assistant regional forester in charge of the Division of State and Private Forestry of the Pacific Northwest region, and in 1943 was appointed regional forester.

Mr. Andrews had been selected by the Chief of the Forest Service to become assistant chief in charge of national forest administration in the Washington, D. C. office, succeeding C. M. Granger when the latter retires this year. The tragedy occurred when Mr. Andrews was on a house-hunting trip in nearby Virginia with Charles L. Tebbe, who was also injured. Their automobile was hit by a truck.

Pennsylvania Forestry Journal in New Size, Under New Name

The late winter issue of *Pennsylvania Forests* — the 246th issue throughout 65 years—is being distributed in new form and under a new name.

Known to three generations of an extensive state-wide membership of the Pennsylvania Forestry Association under the home-spun title of *Forest Leaves*, the journal of the association has for three score years been looked upon as the chronicler of forestry progress and doings in the Keystone State. Time has caught up, however, with its former economical publication in what book people call the octavo or pocket size. Under the name of *Pennsylvania Forests* it will henceforth appear in larger size, approximately 8½ by 11½ inches.

Arthur T. Upson With Western Pine Association

Expanding its forestry field coverage into the Southwest and Rocky Mountains, the Western Pine Association has appointed Arthur T. Upson, veteran forester and lumberman, as district forest engineer for Arizona, New Mexico, Colorado, and Wyoming.

Upson, who retired recently from the U. S. Forest Service after service dating back to 1910, becomes the sixth member of the association's forestry staff whose duties include advisory work in technical forestry, tree farming, and forest conservation. Other forest engineers serve private timber owners in California, Oregon, Washington, Idaho, and Montana.

A graduate of the University of Nebraska forestry school, Upson spent 14 years in the Forest Service as forester, supervisor, and as chief of operation of the Forest Products Laboratory, Madison, Wis., prior to joining the technical staff of the National Lumber Manufacturers association in 1924. He later became trade extension director of the NLMA.

ARTHUR T. UPSON

In 1935, Upson returned to the Forest Service and was made director of the Southwestern Forest and Range Experiment Station at Tucson, Ariz., and in 1942 was called to Washington to organize and direct the War Production Board's Lumber and Lumber Products Division. The following year he was appointed director of the U. S. Forest Service Tropical Region in Puerto Rico and remained in that post for six years.

From 1949, until his retirement last year, he was advisor to the California Forest and Range Experiment Station.

Upson will make his headquarters in Tucson.

Weddell on Kiwanis Committee

D. J. Weddell, dean of the School of Forestry, University of Georgia, has been appointed to the International Committee Agriculture and Conservation of Kiwanis International. It is the purpose of the committee to promote better agriculture and conservation practices throughout the world by emphasizing the fundamental importance of agriculture and conservation in the economy of all nations.

Recommendations of the international committee are forwarded to the local Kiwanis organizations and put into practice at the grass-roots level. In this way, business in the community is helped to realize that its prosperity is dependent upon the prosperity of agriculture and forestry.

Spurr Joins Staff of Minnesota School of Forestry

Dr. Stephen H. Spurr, formerly assistant professor of forestry at Harvard University, joined the staff of the Minnesota School of Forestry on December 1st.

STEPHEN H. SPURR

Dr. Spurr, who is widely known for his work in the field of aerial photography as applied to forestry, and for his book *Aerial Photography in Forestry*, recently returned from Europe where he spent four months studying forest management developments in England, Switzerland, and Germany.

At Minnesota, Dr. Spurr will handle instruction in forest management and forest inventory, and supervise research and study programs of graduate students.

Dr. Spurr received his undergraduate degree in forestry from the University of Florida and his M.F. and Ph.D degrees from the Yale School of Forestry.

Cossitt on Detail in Japan

On special 90-day assignment to help solve some of Japan's reforestation problems, Floyd M. Cossitt, U. S. Forest Service, Atlanta, Ga., is attached to the staff of Lieut. Col. H. B. Donaldson, chief of the forestry section of the Supreme Command, Allied Powers. He will assist in the development of plans and techniques for forest tree nursery expansion and in planting on many of the island empire's idle acres.

Mr. Cossitt for the past 15 years has been associated with the timber management staff of the Region Eight office of the U. S. Forest Service. Much of the South's reforestation program has been under his active direction in cooperation with state forestry organizations.

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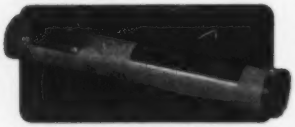

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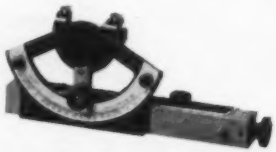

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Thirteen Wilderness Expeditions

The 1951 Trail Riders of the Wilderness activity of the American Forestry Association opens and closes with expeditions into the Pecos Wilderness of the Santa Fe National Forest, New Mexico, June 4 to June 15 and September 4 to September 15.

The Olympic Wilderness in the Olympic National Park, Washington, will be penetrated by the Trail Riders on August 20 to September 1. Also, in Washington, another group will ride in the Cascade Crest Wilderness of the Snoqualmie and Columbia national forests, August 13 to August 25.

Other trips this season include two expeditions in the Flathead-Sun River Wilderness, Montana, on the Flathead, Lolo and Lewis and Clark national forests. The dates are July 5 to July 16 and July 16 to July 27. Two expeditions will leave Sun Valley, Idaho to explore the Sawtooth Wilderness in the Sawtooth and Boise national forests for eleven days, beginning July 24 and August 7. In Colorado, two groups spend ten days in the Maroon Bells-Snowmass Wilderness of the White River and Gunnison national forests. The dates for the Colorado expeditions are July 24 to August 2 and August 7 to August 16.

The High Sierra of California will be the scene of Trail Rider activity from August 29 to September 10. The expedition will start from Lone Pine.

The water wilderness of the Quetico-Superior Area in Minnesota and Canada will be the scene of two canoe expeditions, July 10 to July 19 and July 22 to July 31.

Memphis Aboretum Sponsored by Lumbermen

At the request of the Memphis Lumbermen's Club, the Memphis Park Commission has set aside 120 acres of land for an arboretum. The lumbermen's club is soliciting contributions of the planting stock for its development, which is under the direction of George T. McCall, Shrine Building, Memphis 3, Tenn.

Any reader of the JOURNAL who would like to contribute one or more tree species to this worthy project is invited to send them to Lumbermen's Club of Memphis, Overton Park Storeroom, Memphis, Tenn.

The club is unable to purchase tree stock, but is willing to pay express charges on stock sent in. Mr. McCall requests that all trees contributed be properly tagged as to species and name of sender.

Wisconsin Plans Forest Study

The Wisconsin Conservation Commission is planning field appraisals of Wisconsin forest management this summer aimed at making the most of the state's tree regrowth and meeting mill demands while at the same time speeding the development of trees that are still actively adding to the wood volume they hold.

Wisconsin's volume of available wood is unknown and the state forest inventory has several more years to run before data become available. But the demand for wood has reached an unprecedented height and foresters see an immense wood volume that has reached the static point of deterioration and is slowing the growth of vigorous trees now crowded.

Conservation commissioners believe that the first step to be taken is the promotion of better forest management in state-owned forests. They feel that the same type of management should apply in county forests and should be urged for adoption on the privately owned forest lands, including the woodlots that dot southern Wisconsin. The farm woodlots are potential producers of an enormous volume of wood products if they could be brought under forest management.

State Agency Will Stop Christmas Tree Growing

The West Virginia Conservation Commission is to stop the production and sale of Christmas tree seedlings. The change in policy is being made because it is felt the commission should not compete with private commercial nurseries. To permit the nursery to dispose of its Christmas tree seedlings now planted and growing, the change-over will require a period of four years.

For a number of years Christmas tree seedlings have been produced and sold to commercial producers of such trees for less than half the cost of production.

The commission takes the position that its nursery should not compete with and undersell private commercial nurseries by producing seedlings which are to be used for the production of Christmas trees—a purely commercial enterprise.

Seedlings now planted and growing will be sold at a price that will cover cost of production plus a percentage to take care of other overhead expenses. When this stock is disposed of no more will be grown.

John B. Ferran Dies, Secretary of Louisiana Association

John B. Ferran, 36, executive secretary of the Louisiana Forestry Association, died suddenly of a heart attack in March.

Ferran was a native of New Orleans where he served for six years as public relations director of the New Orleans Dock Board, before coming to the association.

After naming Ferran as executive director in 1948, the Forestry Association embarked on an intense publicity, advertising, and education program aimed at reforestation and prevention of forest fires.

J. H. Kitchens, Jr., chief of the Louisiana State Forestry Commission's information and education program has been asked to serve as temporary executive secretary for the association until a successor has been selected. Kitchens had worked very closely with Ferran the past three years.

Kitchens has headed the information and education program of the forestry commission since 1940. He has been instrumental in helping formulate the Keep Louisiana Green and tree farm programs which the association is sponsoring. He graduated from the L. S. U. Forestry School in 1937 and has devoted his entire time since then in forestry education work. He is on leave from his duties with the commission.

Opportunities Unlimited

Opportunities Unlimited, a publication vividly depicting the way in whch forests influence railroads and other industrial development in the 13 southern states, has been released by the Illinois Central Railroad.

The book gives a wealth of information regarding the history, present status, and the opportunities for realizing the full potential from the southern forests.

In his foreword, Illinois Central Vice President R. E. Barr states that wood and wood products make up a large percentage of his company's freight originating in the South. He adds, "In 1948 the Illinois Central received $25,000,000 gross revenue from hauling wood and wood products. Our foresters tell us this can be doubled."

The booklet states that wood is the raw material for one-sixth of the manufacturing industry in the South. It furnishes jobs for some 445,000 persons who work in these industries, or one-fifth of all workers engaged in manufacturing industries in 13 southern states. In their pay envelopes these employees take home $795,000,000 annually or one-sixth of the South's industrial wage. Thousands of additional workers are engaged in harvesting timber and transporting it to the mills.

Opportunities Unlimited was prepared by J. Walter Myers, Jr., Illinois Central Railroad forestry agent at Baton Rouge, La., and author of several other forestry publications including *Ten Lessons in Forestry*.

The publication is being distributed to wood-using industries, bankers, educators, legislators, and leaders in agriculture and forestry in the South.

J. B. Berry (1880-1951)

James B. Berry, 70, of Winter Haven, Fla., died suddenly at his home on January 3, 1951. Known to his friends as Jim Bert, Mr. Berry was born in Edwardsville, Ill., August 2, 1880.

In 1910 he was graduated with a degree in forestry from the University of Minnesota. He received a masters degree from the Pennsylvania State College in 1913, and later studied at the University of Munchen, Germany. In 1920 he studied vocational education and agriculture at Cornell University.

In 1910 he was appointed forest assistant on the Inyo National Forest, and later he taught forestry at the University of Georgia. Since 1932, Mr. Berry had been engaged in producing and marketing citrus fruits.

Righter Heads Genetics Work

F. I. Righter, research forester who has been breeding better pine trees for 20 years, is being placed in charge of forest genetics research at the California Forest and Range Experiment Station to succeed the late W. P. Stockwell.

Mr. Righter started his forest genetics studies in 1931 at the Institute of Forest Genetics, a branch of the experiment station located near Placerville, California. He has worked primarily on development of techniques for hybridizing pine and for testing the performance of pine hybrids.

As a result of this work, more than 40 pine hybrids have been produced at the Institute of Forest Genetics.

Before coming to the experiment station, Mr. Righter conducted sugarcane research in the Hawaiian Islands and forestry studies at the Southern Forest Experiment Station of the U. S. Forest Service. He earned Bachelor of Science and Master of Forestry degrees from Cornell University.

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Rhinelander Paper Company Underwrites State Nursery

The Wisconsin Conservation Commission has approved a plan offered by the Rhinelander Paper Co., to underwrite much of the cost of continuing the Hugo Sauer nursery near Rhinelander in a cooperative program with the U. S. Forest Service and the state conservation department. The offer was submitted by Folke Becker, company president.

U. S. Forest Service recently announced that because of limited funds it would discontinue the nursery. Becker said that it should be continued to prevent the loss of money it would require to activate the nursery at some future date, and for the restocking of Wisconsin pine forests.

Under the proposal made by Becker, the Rhinelander Paper Co., will provide the money to keep the nursery going. Forest Service will keep its personnel at the nursery, with the state conservation department distributing the trees.

The Rhinelander Paper Co., under the proposal, will be reimbursed from the sale of planting stock. The company agrees if necessary, to spend up to $10,000 over and above receipts from the sale of tree stock to keep the nursery in production.

The nursery was started in 1931 by the United States Forest Service through funds raised by the late Hugo Sauer of Milwaukee. Sauer was committee chairman of the Kiwanis clubs' drive that raised $6,000 for seedlings. Land was donated by Oneida county.

In 1934 the nursery was increased from 16 to 32 acres, and has produced more than 150 million trees that have been planted on national forests. It is modern, with complete equipment, a seed extractory, and good soil.

Pennsylvania Scrub Oak Studies Reported

A new pamphlet, *Scrub Oak in Pennsylvania*, has been released by the Pennsylvania Department of Forests and Waters, Harrisburg.

Prepared by the department's Division of Forest Research, the publication summarizes the results of forty years of research on the problem of scrub oak.

Copies may be obtained on request of the Department of Forests and Waters.

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JOURNAL OF FORESTRY PRESENTED TO JAPANESE DIET LIBRARY. T. Kanamori, librarian of the Diet Library, reads a letter of thanks to Lt. Col. H. G. Schenck, chief, Natural Resources Section, GHQ, SCAP, for the gift of a complete set of the JOURNAL OF FORESTRY. In the picture, left to right: Col. Schenck; Frederick J. Shulley, forester, NRS; Naotaka Sato, president of the House of Councilors; T. Kanamori; Lt. Col. H. B. Donaldson, NRS; and H. D. Bruce, NRS. Within the past two years, 1,627 copies of the JOURNAL have been contributed by the forestry profession in the United States, sent to Japan, and distributed by the forestry Division, NRS, to 17 educational institutions. The set illustrated above was contributed by George M. Hunt, director of the Forest Products Laboratory, Madison, Wis.

Georgia Forestry Day

On May 5 Georgia celebrated Forestry Day. A proclamation so designating this date had been issued by Governor Talmadge.

The School of Forestry, University of Georgia, and its alumni society cooperated in a program honoring the alumni who lost their lives in World War II and to stressing the importance of forestry to the state. A memorial plaque was unveiled by Senator Water F. George.

Rueben H. Robertson, chairman of the board, Champion Paper and Fibre Corporation, and Man of the Year in Southern Industry, spoke on "Fifty Years of Progress in the Pulp and Paper Industry."

Governor Herman Talmadge addressed the noon luncheon, pointing to the advances in the forestry program in Georgia.

The annual field day held during the afternoon was followed by the annual alumni-senior banquet. Leo Aikman, associate editor of the *Atlanta Constitution* was banquet speaker.

The alumni society held its annual meeting on May 4 featuring four panel discussions: "Present status of the important tree diseases in the South"—moderator, Dr. W. A. Campbell, Bureau of Plant Industry; "Use of modern media in information and education"—moderator, Professor G. N. Bishop, School of Forestry; "Modern forest survey techniques for forest properties"—Wm. Fischer, U. S. Forest Service, Atlanta; and "Wildlife as a forest crop in the South"—Professor James Jenkins, School of Forestry and State Game Commission.

This program was part of the Sesqui-centennial program of the University of Georgia.

Tractor Handbook in Comic Style

A four-color operator's handbook printed in comic book style and prepared especially for heavy equipment operators is now being distributed by Caterpillar Tractor Co.

The 32-page book contains information on the operation of bull-dozers, scrapers, rippers, and cable controls, plus additional material on high speed hauling, loading, and grade stakes familiarization.

It explains when to use bulldozers, how to pioneer side hill cuts, push loading, rock and tree removal, soft fill work, do's and don't's of proper tractor-dozer adjustment and operation, and other earthmoving applications.

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In its three parts, the author presents the composition of virgin forests, analyzes and compares climax communities, traces the expansions and contractions of the deciduous forest formation and its segregation into types, and demonstrates the genetic relations of its several parts.

Of unusual value is the 22" x 23" map of forest regions which is folded into the binding. (Additional copies printed on linen, suitable for field work or framing, may be purchased separately. $1.50 per map.)

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Tennessee Becomes 29th Keep Green State

Tennessee is the nation's twenty-ninth state to adopt the Keep Green program and the first to adopt it this year.

More than 400 leaders from all over the state, called together by the Tennessee Conservation League, braved winter's worst ice storm to attend the meeting in Nashville on February 8. They heard the program lauded by Governor Browning, Conservation Commissioner C. P. Swan, and Tom Wallace, editor and conservationist of Louisville, Ky.

Wallace, editor emeritus of the *Louisville Times* and a past president of the Izaac Walton League, hailed the Keep Green movement as "one of the most important enterprises in the nation." Governor Browning announced he would ask the state legislature for a severance tax on resources to provide revenue for conservation of timber, soil, and water.

At a business session presided over by Grover Rann, Cleveland, representatives organized the Keep Tennessee Green Association and elected Lou Williams, of Chattanooga, president. Williams is retiring as president of the Conservation League to assume his new duties with the Keep Tennessee Green organization.

Bark Beetle Outbreaks in Southern Pine Forests

Bark beetles killed over 25 million board feet of pine timber in East Texas in 1950, according to the Bureau of Entomology and Plant Quarantine. The area involved was only about 200 square miles. Other outbreaks occurred in other southern areas, but on a more limited scale.

These outbreaks apparently are continuing into 1951.

Three kinds of beetles are responsible for the destruction according to Dr. James A. Beal head of the bureau's Division of Forest Insect Investigations. The worst of the three is the southern pine beetle, but the black turpentine beetle and engraver beetles are also involved.

An effort is being made to detect and record the presence, and abundance, of these destructive pests, by federal, state, and public land-managing agencies.

The public can assist in this work, Dr. Beal said, by reporting the presence of any of these three insect pests to the Division of Forest Insect Investigations, 223 Federal Building, Asheville, N. C., or P. O. Box 151, Gulfport, Miss.

Airplanes and Helicopters Protect National Forest Timber

A summary of fire-fighting activities for 1950 reveals that the U. S. Forest Service used fixed wing aircraft for a total of 8,248 hours. These airplanes transported 10,244 passengers, carried 754,000 pounds of cargo, and dropped 345,000 pounds of cargo by parachute. Helicopters in 1950 flew a total of 1,381 hours, or 2,975 flights, for the Forest Service. The bulk of this flying time was spent in fighting forest fires in California, where helicopters were in the air 1,255 hours.

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Water Resources Policy Report Completed

The President's Water Resources Policy Commission, which was appointed in January 1950 to study and make recommendations on policies in the field of water resources, together with existing legislation, has just released to the public the last of its three-volume report.

The Commission's main report, Volume 1 entitled *A Water Policy for the American People*, offers a coordinated national program for the development of water resources, and specific recommendations on policy. Volume 2, *Ten Rivers in America's Future*, is a study of 10 river basins in different parts of the country and includes a detailed discussion of the problems of each basin with a mass of pertinent material never heretofore published. Each of these basin studies has been published as a separate. The third volume, *Water Resources Law*, summarizes federal law concerned with the nation's water resources.

A 24-page pamphlet containing the Commission's summary of recommendations, reprinted from Volume 1, gives a concise idea of the scope and content of the report. Copies of each volume, the Summary of Recommendations, and the 10 river basin studies, may be purchased from the Superintendent of Documents, Washington 25, D. C., at the following prices: Vol. 1, $3.25; Vol. 2, $6; Vol. 3, $2.25; Summary, 15 cents.

The separate sections of Volume 2 may be had for prices varying from 50 cents to $1. The series includes the Columbia, Missouri, Rio Grande, Colorado, Connecticut, Alabama-Coosa, Potomac, Ohio, and Tennessee Rivers and the Central Valley of California.

New Circular Saw

A new saw is claimed by the manufacturer to be a decided improvement over any similar type saw. The style of the tooth eliminates the need for expensive sharpening equipment and permits easy resharpening by hand. The cutting edge of the tooth is designed with a definite pattern which is easy to follow. As the stock is filed back on the cutting edge in resharpening, a convenient gullet, which offsets the cutting edge, can also be moved back—thus the original tooth pattern can be maintained after several sharpenings.

The new Micro-cut course-tooth, safety circular saw, was recently introduced by the F. Heinemann Saw & Mfg. Co., Canton, Ohio.

Budworm Control Film Available

Controlling the Spruce Budworm, an action packed 20-minute sound and color motion picture of the 1950 budworm battle in the Pacific Northwest, has been completed. Aerial photos of the spraying program and the fight to save the Pacific Northwest forests from the budworm epidemic are pictured.

Sponsored by the Oregon State Board of Forestry, the Pennsylvania Salt Manufacturing Company of Washington, and the Portland Motor Transport, the film shows scenes of spraying and other work both east and west of the Cascades. John B. Woods Jr., Oregon deputy state forester and supervisor of the state's budworm program in 1950, supervised the script for the picture.

Leonard Delano Studios of Portland photographed and produced the movie. This firm has been active in the Northwest logging and lumber photography field for 15 years and in the aerial mapping photography field the past five years.

Copies of the film or showings can be arranged through any of the above individuals or firms mentioned.

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THE FIRST NATION-WIDE CONSERVATION TOUR has been scheduled by the summer session of the University of Connecticut for 1951. The tour will swing through the southern states to the west coast and return through the northern states. Getting underway in late June it will cover about 10,000 to 12,000 miles of travel, returning in late August. The objective is a first hand study of the nation's natural resources, particularly those of a renewable nature. Good and bad practices in the utilization and management of water, soil, forest, and wildlife resources will be observed.

Travel will be by bus, accompanied by a trailer and car equipped as a kitchen. The members of the tour will carry their own sleeping bags and tents and will camp out in national and state parks and forests.

The tour will be conducted by Dr. Raymond Kienholz, professor of forestry in the College of Agriculture, University of Connecticut. Dr. Kienholz has had years of experience in teaching and research in botany and forestry in many parts of the United States and the Philippines and has travelled widely in the West.

Credit will be given by the university for satisfactory completion of the tour. Enrollment is already well advanced and consists chiefly of teachers and advanced students. The cost will be nominal and will be based on the actual expense of registration, travel, food, admissions, and incidentals.

For further information, or to apply for admission, write to Summer Session, University of Connecticut, Storrs, Conn.

Bogs Disclose History, Quetico-Superior Country

In a new, 26-page booklet, *Bogs of the Quetico-Superior Country Tell Its History*, Dr. J. E. Potzger, professor of botany, Butler University, traces the history of the forest cover in the Quetico-Superior country, on the Minnesota-Ontario border, back to the end of the last Ice Age, probably some 10,000 years ago.

The field work for this study was done during the summer of 1949 and the extensive laboratory analysis of samples for the study was completed late last year.

The study reports on the use of radioactive carbon (Carbon 14) tests which were made for the first time on peat samples. It provides an interesting and accurate documentation of climatic changes and the resulting pre-dominanee of certain species and genera of forest trees that resulted. This is the first time that such a comprehensive survey has been made in such a cohesive area and, while the findings may have to be evaluated in millenia, it is a signal contribution to silvicultural planning.

The booklet is published by the President's Committee for the Quetico-Superior Area, 919 North Michigan Ave., Chicago 11, Ill.

Louisiana Association Publishes New Quarterly

The Louisiana Forestry Association in March published the first issue of *Forests and People*, an attractive magazine designed to provide information and news about Louisiana forestry. Each issue will include also semi-technical articles of the how-to-do-it type to guide members of the association in dealing practically with their forestry problems.

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Wildlife Conference Well Attended

The 16th North American Wildlife Conference was held in Milwaukee, March 5, 6, and 7, with more than 1,000 in attendance.

Several foresters were on the program. Charles H. Stoddard and S. T. Dana read papers on economic and social aspects of wildlife.

Paul A. Herbert presided at a session devoted to consideration of a natural resources policy, at which E. L. Demmon read a paper on a national policy for timberlands. Lee E. Yeager and C. C. Freeburn participated in a session on big game resources.

A meeting of the Society of American Foresters Division of Forest-Wildlife Management was attended by 35 members. Chairman Warren W. Chase presided. A discussion on predators was led by Ralph H. Hill and another on wildlife education in forestry curricula by Harold W. Steinhoff. Paul D. Dalke described the progress in compiling the forest-wildlife section of the forthcoming *Foresters' Field Manual.*

Two related meetings were held of interest to foresters.

An open meeting was called by the Forest Service to discuss the work of the President's Quetico-Superior Committee in preserving the Quetico-Superior canoe wilderness of northern Minnesota. J. H. Price spoke on wilderness zoning. Galen Pike reported on the roadless areas.

The Natural Resources Council of America held an open meeting at which Chairman Henry Clepper presided. Among topics on which action was taken were plans for establishing grassland monuments and a proposed national land and water policy.

The Leopold memorial medal for service to wildlife conservation, named after the famed wildlife manager and forester, the late Aldo Leopold of the University of Wisconsin, was awarded to Carl D. Shoemaker of Washington, D. C., at the wildlife conference dinner on March 6.

Aldo Leopold Memorial Medal

Awarded annually by the Wildlife Society, the Leopold medal is one of the outstanding conservation awards. In 1936, together with J. N. Darling —first recipient of the medal—Mr. Shoemaker helped organize the National Wildlife Federation, of which he is conservation director. He is editor of *Conservation News Service* for the Natural Resources Council of America, of which the Society of American Foresters is a member.

Mr. Leopold, who died in 1948, had been a lifelong member of the Society of American Foresters, and a former associate editor of the JOURNAL OF FORESTRY.

The Muskingum Story

One of America's outstanding flood control watershed management projects, the Muskingum Watershed Conservancy District in Ohio, is featured in a new publication of The American Forestry Association.

The Muskingum Story, a 16-page illustrated pamphlet, is being used by the association to show the value of small, locally developed watershed units as a way to accomplish flood control, wise use of water, recreational developments, all tied into upstream land management.

The Muskingum approach of self-government, with cooperation of local, state, and federal agencies, without the creation of new agencies, helps to answer some of the problems brought out recently by the President's Water Resources Commission.

Control of the Muskingum District, organized in 1933, rests with a local conservancy court composed of judges of Common Pleas Courts of the areas of Ohio covered by the District. The District operates on its own income, without tax support, and pays its way even to the extent of paying taxes. Forest management comprises a large part of the Muskingum's operation.

P. J. Hoffmaster, Michigan Leader, Dies

P. J. Hoffmaster, director of the Michigan Conservation Department since 1934, died of a heart attack March 19 at the age of 58. He had joined the department in 1922 as superintendent of state parks.

Born in Pennsylvania, he was graduated from Michigan State College in 1918 with a B.S. degree in landscape architecture. Following brief service as a World War I artillery lieutenant, he was employed by the City of Detroit for two years.

He was a member of the Water Resources Commission, Aeronautics Commission, Soil Conservation Commission, and was president of the International Association of Fish, Game and Conservation Commissioners for five years. He was also state supervisor of oil and gas wells.

Hoffmaster was largely responsible for extensive land acquisition for recreational purposes and for the development of the state park system.

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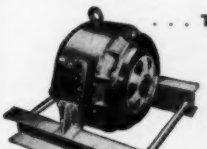

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John H. Foster (standing) addressing for the last time as State Forester his fellow-workers in the New Hampshire State Forestry & Recreation Department. Seated (left to right): Mrs. John H. Foster, Warren F. Hale, Assistant State Forester and toastmaster; and Governor Sherman Adams.

John H. Foster Retires

It couldn't happen in every state and the same circumstances may not occur again in New Hampshire.

Speaking as the Governor of the State and so proud of his 21-year membership in the Society that he referred in his address to the S.A.F. emblem he was wearing, Sherman Adams expressed the official appreciation of the state for the 31 years of service as State Forester which John H. Foster, member of the Society since 1910, completed on February 28.

The occasion was a testimonial dinner held at Concord, N. H., with John and Helen Foster as the surprised guests of nearly 100 state officials and fellow foresters.

The Governor, recalling his lumberjack days, mentioned that John Foster was the first state official he ever met. He then extolled Foster's solid virtues and presented the retiring state forester with a handsome citation drafted by the Governor in cooperation with his Executive Council.

Although primarily a group tribute sponsored by the State Forestry and Recreation Department, many members of the Society of American Foresters were present, including S.A.F. vice president C. S. Herr of the Brown Company; Robie M. Evans, retired eastern regional forester; Harold B. Shepard, forestry consultant of the Federal Reserve Bank of Boston; and Robert S. Monahan, vice chairman of the New England Section.

Among the Society members who took part in the speaking program were Warren F. Hale, assistant state forester, serving as toastmaster; Edgar C. Hirst, first N. H. state forester, W. R. Brown, chairman of the State Forestry and Recreation Commission since 1911; Perry Merrill, Vermont state forester; W. S. Swingler, eastern regional forester; Kenneth E. Barraclough, extension forester; Harris Reynolds, secretary of the New England Forestry Foundation; Lawrance W. Rathbun, forester of the Society for Protection of New Hampshire Forests; and E. D. Fletcher, first New Hampshire extension forester.

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Forestry Conference at Missouri

Despite the heaviest sleet and snow storm of the winter, seventy federal, state, and privately employed foresters from Missouri attended a conference at Columbia, February 15 and 16, to learn of recent developments in several forestry subjects, according to R. H. Westveld, chairman of the Department of Forestry, University of Missouri. The conference was sponsored by the College of Agriculture, the first since a similar meeting in 1946.

Instructors representing the U. S. Forest Service, Division of Forestry of the Missouri Conservation Commission, forest industries, and the University of Missouri lectured on utilization and marketing, social and land-use aspects of wild land management, objectives of Missouri's forestry programs, and silvicultural problems. Results of research work in progress at the Northern Ozark Forest Research Center and the university were presented, and aerial photogrammetry equipment and techniques were exhibited.

At a banquet in the Daniel Boone Hotel, I. T. Bode, director of the Missouri Conservation Commission, addressed the group on the importance of cooperation between all users, rather than a few conservation groups, in the management of wild land. Movies documenting the work of the university and the first public showing of a movie in color concerning the use of the forest resources of the northern Ozarks produced jointly by the Conservation Commission, Clark National Forest, and Mark Twain National Forest were shown.

Objectives of federal and state agencies and forest industries were reviewed to determine how well they supplement each other in a broad forestry program. R. R. Rowe of the Doane Agricultural Service, St. Louis, told of his company's experience with farm buildings, that the investment in buildings was often too great for the income obtainable. To show a larger profit ratio Doane designed and builds low-cost farm buildings from treated wood. The structural members are poles set in the ground to which siding and roof are fastened. Buildings are designed to reduce chore labor to a minimum; for example, in a cattle barn, hay is stored at feeding level to eliminate hoisting to a loft and later forking it down to feed areas. Simplified construction methods often reduce lumber costs by half and the elimination of concrete foundation effects additional saving. This construction principle could well be considered by forest managers for woods offices and equipment storage sheds.

Professor H. H. Krusekopf of the University Soils Department described the system of land-use classification which the Agricultural Experiment Station has developed and will soon employ in connection with soils surveys. Seven broad classes of land-use include one for range lands and another for forests. Contrary to common belief, he suggested that foresters are justified in recommending certain of the more fertile sites for forest use rather than relegating forests to the least productive soils; that foresters should spend more to improve stands on their best soils where development will show to greater advantage.

Professor C. E. Lively, chairman of the Department of Rural Sociology, said that fire protection has been less effective than it might because emphasis has been on the physical control of fires while the human element which is responsible for starting most fires has been largely neglected. He suggested a long-range educational program for school-age children including forestry clubs and forestry material worked into other courses in public schools. Materials used for public education such as posters should be scientifically tested before release to obtain the effect desired, exhibits should be simplified to present one idea instead of several, and news of occurrence of fires should be given greater publicity and linked with national defense.

Ashton Named Forester Champion International Co.

Champion - International Company, Lawrence, Mass., manufacturers of quality coated papers, has recently added Richard V. Ashton to its staff. Mr. Ashton will be in charge of field activities in pulpwood procurement, with the capacity of forester.

Mr. Ashton has been associated with the New York State College of Forestry and was assistant to the director at the Charles Lathrop Pack Demonstration Forest at Warrensburg, N. Y. Prior to this he had been with the U. S. Forest Service for thirteen years. He attended Massachusetts State College and is a graduate of the New York State Ranger School. He is a member of the Society of American Foresters and was chairman of the northern New York chapter. Mr. Ashton has also been active in Boy Scout activities as a district chairman of the Adirondack District.

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A firm to provide specialized forestry services for public utilities industries has been established by George D. Blair in Jackson, Mich. Known as Forestry Consulting Services, the firm is prepared to manage trees and other forms of plant growth in a manner to avoid interference with utility services. Basic surveys, planning, analyses, field reviews, economic studies, and specifications dealing with the control of vegetation are among the services provided.

Newspaper Hires Forester Through JOURNAL Advertisement

John B. White has been named forester for the Hattiesburg (Miss.) *American*, the first forester to be employed by a newspaper to cover forestry actvities as a reporter and to render professional services to landowners within the paper's trade territory.

The *American* plans to set up a model forestry property, and has purchased a timber property which White will manage.

White is a native of Birmingham, Ala. He received his B.S.F. degree from the University of Georgia in 1948, and a Master's degree in forestry from North Carolina State University in 1950. He obtained the position with the *American* by answering an advertisement which appeared in the JOURNAL OF FORESTRY.

JOHN B. WHITE

Engineer Forestry Company at Paul Smith's College

Paul Smith's College, Paul Smiths, N. Y., has been chosen as the site for the 1685th Engineer Forestry Company (training) of the Organized Reserve Corps. The unit was activated March 15, 1951.

Three platoons—headquarters, manufacturing, and logging—make up the company. The training of the military specialists will be done on college operations. Cooks and mess sergeants will be drawn from the Hotel Management Department of the college. Blacksmiths and mechanics will receive training in the college shops. The manufacturing platoon will train in the Lane No. 2 sawmill located on the campus. Twenty-thousand acres of Paul Smith's College woodlands surrounding the campus furnish a training site for the logging platoon. The college maintains a small permanent logging crew which will assist in the training.

Major R. D. Fish, T.C.—USA who received his forestry degree from the University of California in 1940 was instrumental in locating this unit at Paul Smiths. It will be commanded by William Rutherford, Capt. C.E.—USAR who is head of the Forestry Department at Paul Smith's College. Mr. Rutherford received the M.F. degree from the University of Michigan in 1940.

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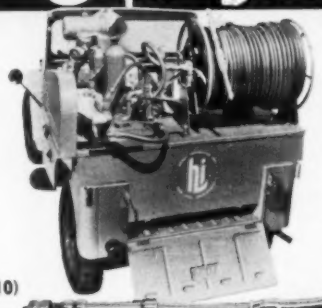

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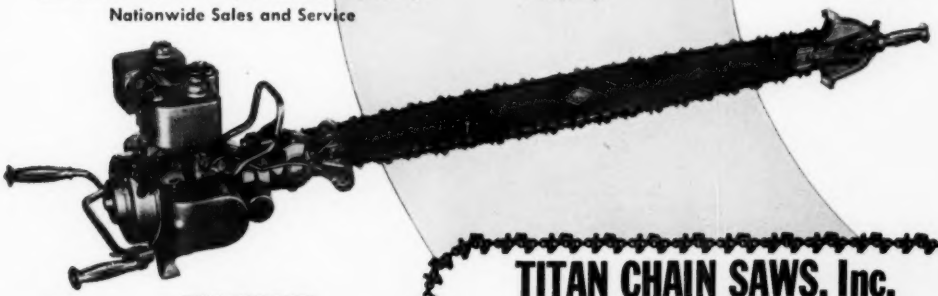

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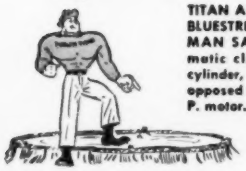

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